A.A.R. MECHANICAL AND P & S DIVISIONS PROCEEDINGS

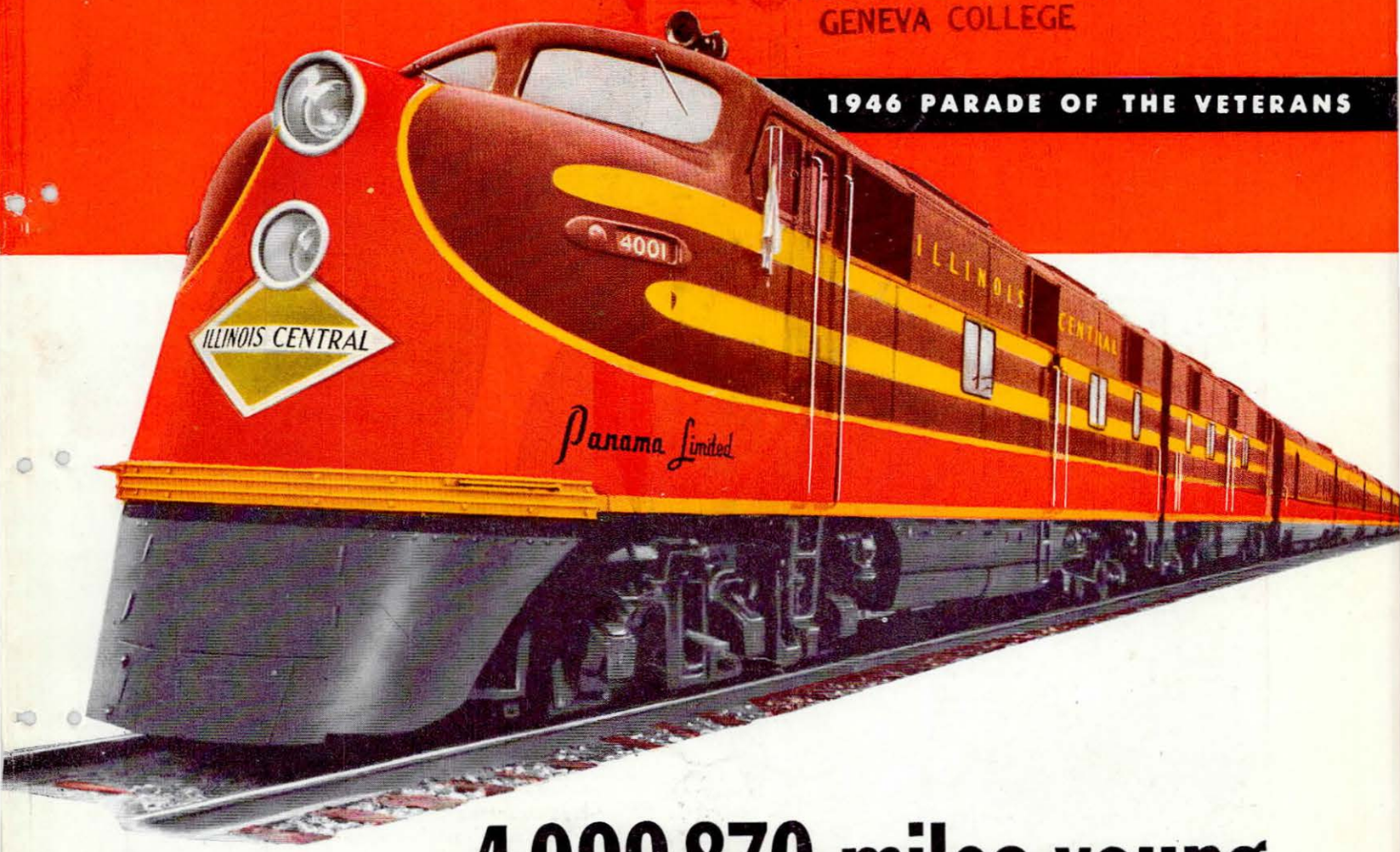
AUGUST 17, 1946

Railway Age

Founded in 1856

McCARTNEY LIBRARY
GENEVA COLLEGE

1946 PARADE OF THE VETERANS



4,099,870 miles young

REMARKABLE running records here, there and everywhere, are on-the-rail evidence of the soundness of General Motors Diesel locomotives.

Witness the record of three crack passenger Diesels on the Illinois Central — their two Panama Limiteds and City of Miami.

While the oldest of these locomotives is only 5½ years of age, together they have amassed a total of 4,099,870 miles. This is a monthly mileage average of 24,428 (each)— or the equivalent of over 800 miles every day in service.

Together, these locomotives have met their assigned mileage 95.8% of the time. One of them has shown 100% availability for 17 months. Running between Chicago and the South, these locomotives face extreme cold and extreme hot weather in the course of a year. They have continued to carry especially heavy passenger traffic.

So here again, General Motors' understanding of Diesels—advanced designing — most complete and modern manufacturing facilities — demonstrate their value in terms of revenue-earning service.

VETERANS IN PERFORMANCE

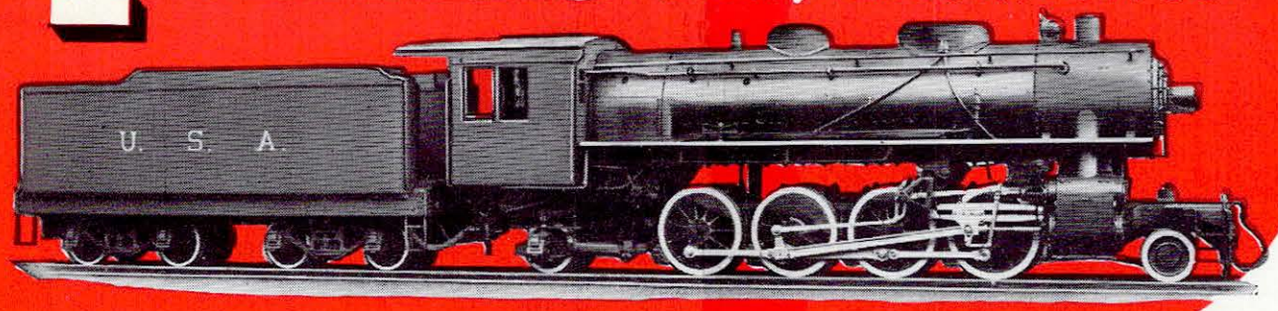
GENERAL MOTORS LOCOMOTIVES

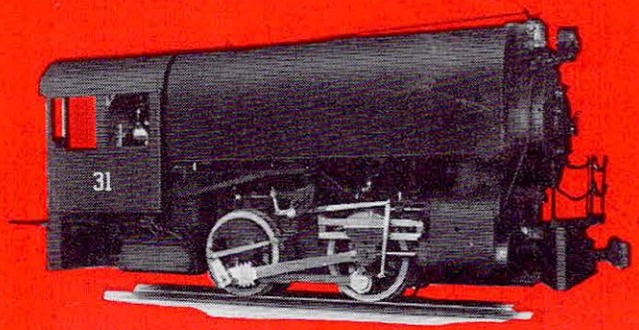
YOUTHFUL IN STAMINA

ELECTRO-MOTIVE DIVISION

GENERAL MOTORS • LA GRANGE, ILL.

PORTER Steam Locomotives

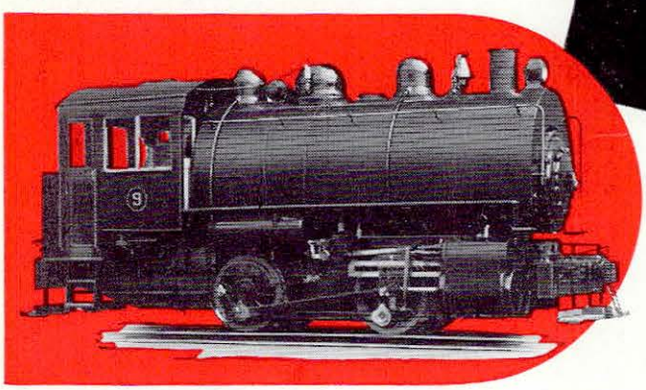




Lower Operating Costs

Less Maintenance

Greater Availability



Here are some of the features that give PORTER Locomotives their EXTRA STAMINA

1. Extra-heavy frames, flame-cut from solid, heavy-section, Universal mill plate. Annealed and heat-treated after cutting.
2. Axles, crank pins, guides, rods, and other strain-bearing parts solid-forged from best quality open hearth steel.
3. Extra large bearing surfaces on all moving parts.
4. Accurate machining of all wearing and fitted surfaces.
5. Case-hardened pins and bushings at all vital parts.

PORTER "Better Built" Equipment
Established 1866

LOCOMOTIVE DIVISION:
Diesel, Diesel-Electric, Steam and Fireless Steam Locomotives

FORT PITT SPRING DIVISION:
Coil and Elliptic Springs for Locomotives, Freight and Passenger Cars.

PROCESS EQUIPMENT DIVISION:
Complete Line of Chemical, Food, and Petroleum Refinery Equipment.

QUIMBY PUMP DIVISION:
Screw, Rotex, and Centrifugal Pumps.

HINDERLITER TOOL DIVISION:
Oil Well Drilling Equipment.

H. K. PORTER COMPANY, Inc.

PITTSBURGH, PA. • BLAIRSVILLE, PA.

NEWARK, N.J. • NEW BRUNSWICK, N.J. • MT. VERNON, ILL.

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WHY WE URGE CONSUMERS OF STEEL TO SHIP SCRAP NOW

You want more steel. The steel mills want to make it for you. But what they can produce is limited by the shrinking volume of scrap now coming to them. Mill backlogs of scrap are almost non-existent, with operations on a hand-to-mouth basis. To hold steel production where it is, expand it if possible, much larger supplies are needed.

Many of the concerns that need steel most urgently are the very ones that can do the most to ease this critical situation.

Most scrap that feeds the steelmaking furnaces originates with steel consumers. That is why we suggest that metal-working concerns, railroads and other consumers of steel make a check-up of all iron and steel scrap now in their possession, gather up and ship immediately every available ton of it—and see that it moves as rapidly as possible toward a steel mill.

By doing this you will help to avert a steel-scrap famine and to maintain and even increase the output of steel. More scrap for steel mills means more steel for you.

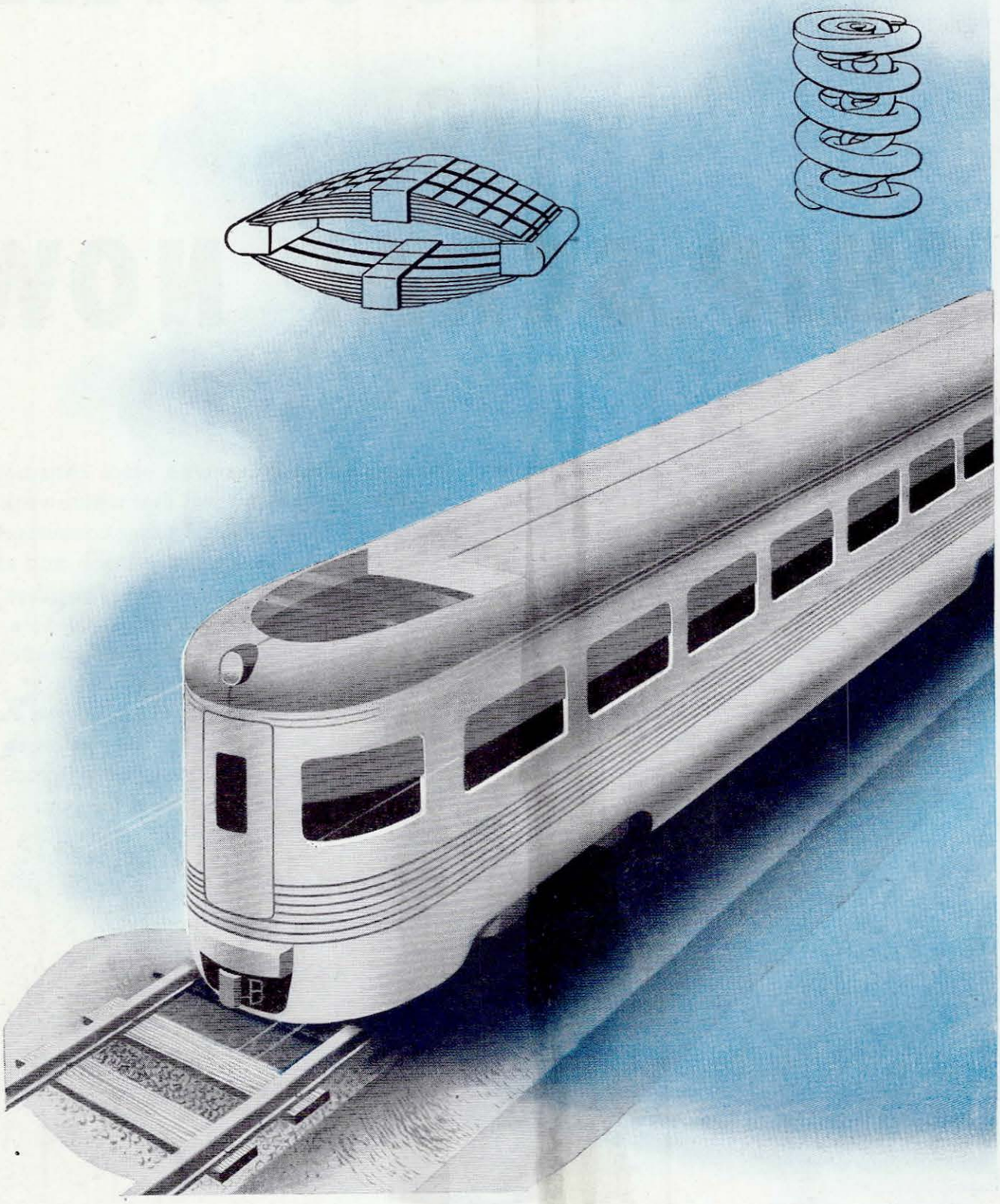
BETHLEHEM STEEL COMPANY
General Offices: Bethlehem, Pa.

BETHLEHEM PACIFIC COAST STEEL CORPORATION
General Offices: San Francisco

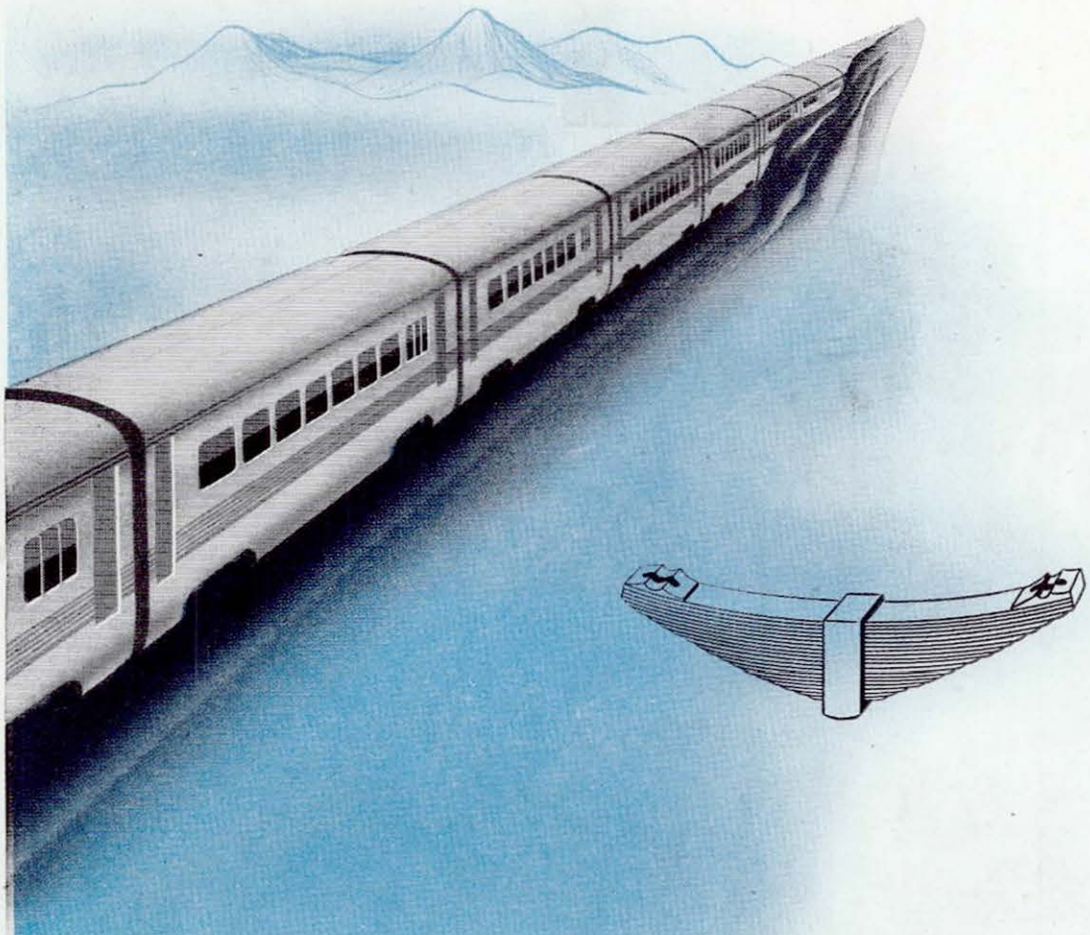
★ BETHLEHEM STEEL ★

More power and speed will help your new equipment

build traffic, but... **Remember that-**



— Railroad Popularity Rides On Springs!



NO QUESTION about it—more power and speed is in line with railroad needs and trends. And the very fact that the new trains will be faster trains increases the responsibility and burden of SPRINGS, and of the entire spring assemblies, installed in those trains.

When you specify RAILWAY STEEL SPRINGS for such equipment you can be sure that the new problems presented will be handled adequately and smoothly.

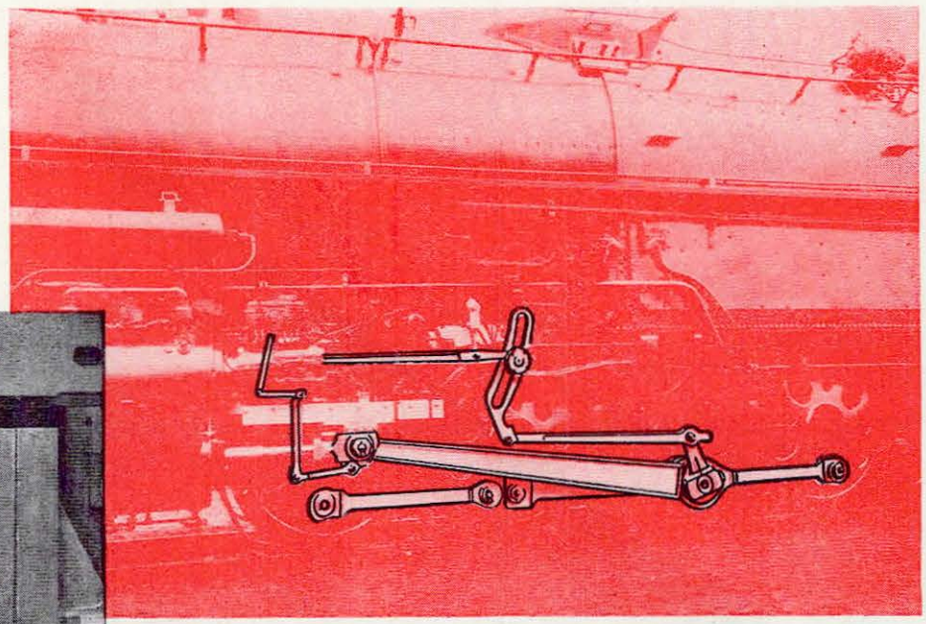
The fact that RAILWAY STEEL SPRINGS are in service on so many of America's leading railways is evidence of the consistent ability of their designers and makers to solve practical railway spring problems to the complete satisfaction of practical railway men.

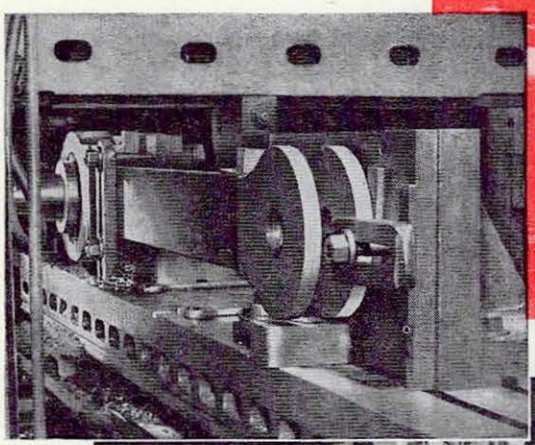
American Locomotive

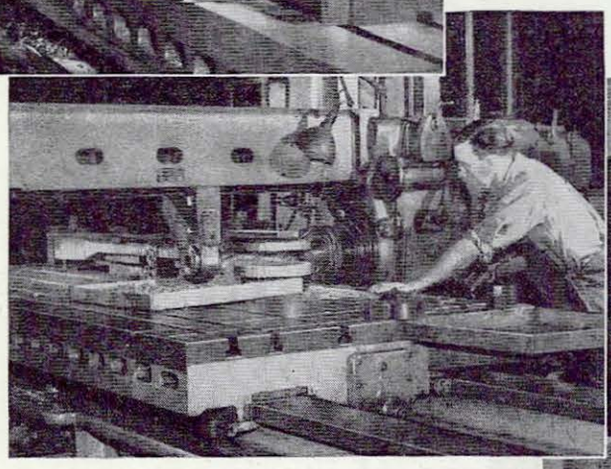
Alco

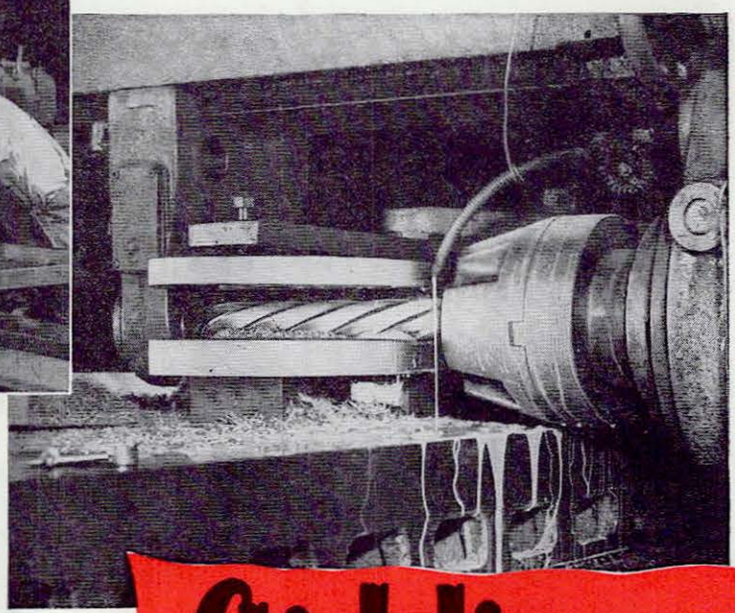
THE MARK OF MODERN LOCOMOTION

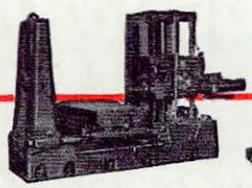
for Rapid Production of



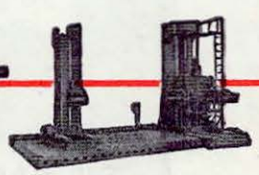








G. & L. Table Type Machine



G. & L. Floor Type Machine

Giddings

MACHINE

150 DOTY STREET

LOCOMOTIVE SIDE RODS... MAIN RODS... GUIDE BARS...

use a STANDARD G.&L. MACHINE

Single Machine With Cross Rail Arbor Support Handles an Endless Variety of Railroad Machining Jobs Ordinarily Routed to Several Special Machines.

A progressive railroad repair shop unable to obtain badly needed side rods, main rods and guide bars was able to keep already scarce locomotives in operation by making these parts themselves. A standard Giddings & Lewis horizontal boring machine easily produced these essential engine components. All machining operations, including channeling, slab milling, end milling, trepanning and boring were performed on the G. & L. machine. Over-all machining time was reduced to such an extent that it was possible to handle numerous other important jobs as well on this versatile machine tool.

Milling the Clevis and Boring Side Rods

This typical set-up shows the simple manner in which a side rod clevis is milled. A slab mill amply supported by a cross rail arbor support removes the bulk of the metal in a single pass. The close-up photograph shows the finishing cut being made to give accurate clevis dimension. After this milling operation is completed, the side rod is mounted on angle plates prior to boring. A trepanning tool is used and removes the metal as a slug. The finish boring operation is made with the cutter head shown. *On this 9¾" bore 6½ hours were saved in boring the rod end alone* with a like saving on other machining operations.

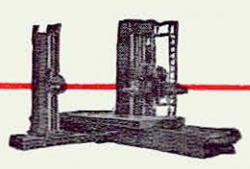
The practical answer to your railroad machining problems may be found in the multiple purpose standard Giddings & Lewis horizontal boring machine. G. & L. engineers will be glad to consult with you.

STANDARD G.&L. MACHINE EASILY PERFORMS THESE TYPICAL RAILROAD MACHINING JOBS

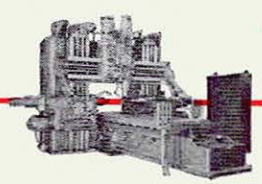
- Channeling main and side rods.
- Milling tongue, clevis and ends of side rod.
- Slab milling rods and guide bars.
- Trepanning and boring rods.
- Milling, boring and facing axle housings.
- Milling slots in links.
- Milling shoes and wedges.
- Boring, facing and chamfering cylinders.
- Machining steam pipes.
- Quartering driving wheels.
- *And Many Others.*

& Lewis
TOOL CO.
FOND DU LAC, WIS.

RAILROAD MACHINING INFORMATION — Descriptive of Giddings & Lewis machines for men interested in increasing work output. Write for this *Free* data now — ask for Bulletin RA 86.



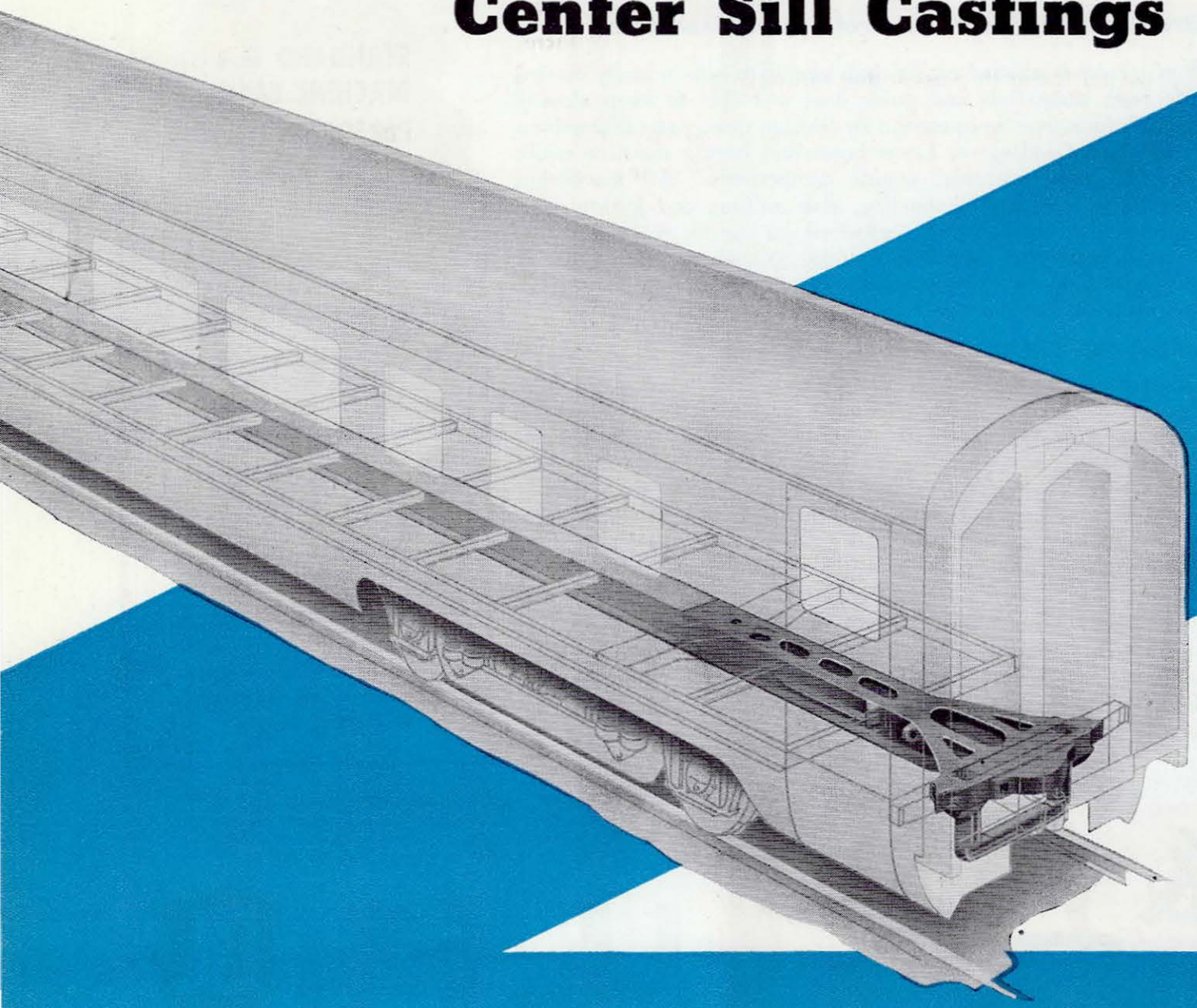
G. & L. Planer Type Machine



G. & L. Multiple Head Type Machine

STRENGTH to RESIST

COMMONWEALTH
One-Piece Platform
Center Sill Castings



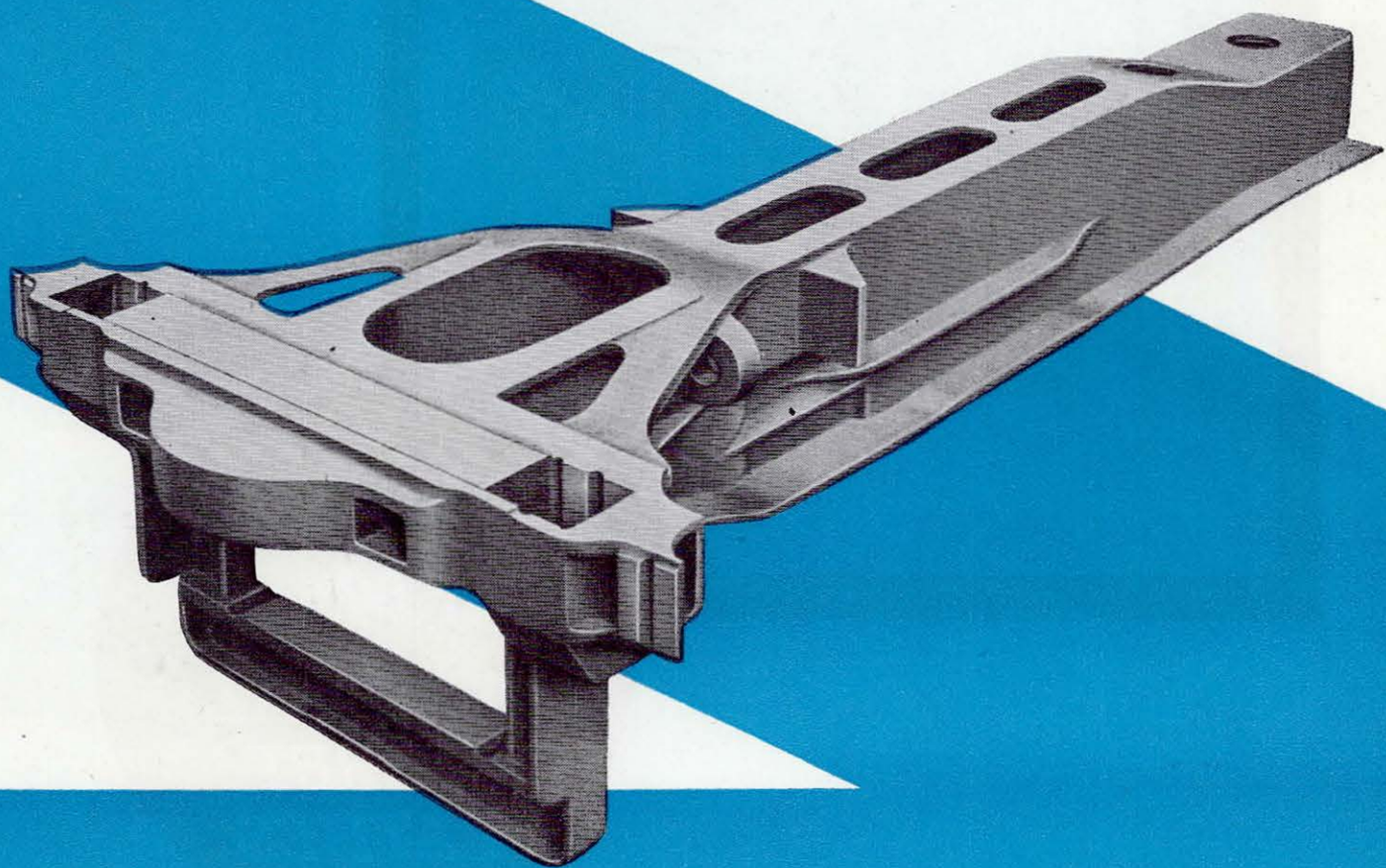
GENERAL STEEL

SHOCKS and STRESSES

COMMONWEALTH one-piece cast steel PLATFORM CENTER SILLS provide the ruggedness and inherent strength so essential to resist heavy stresses and the impact of end-shocks in high speed passenger train operation. They offer the simplest and strongest construction; minimizing damage to car structure in collisions, and meet all safety requirements.

The advantages of this single unit casting over assembled, welded structures *also* include greater strength without any increase in weight, a vital factor in present day railroading.

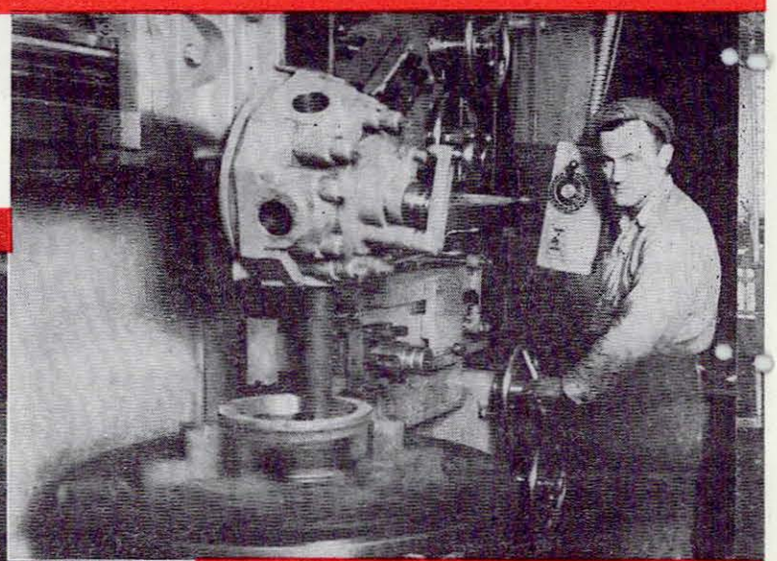
For strong, safe, better-built passenger cars—specify COMMONWEALTH ONE-PIECE PLATFORM CENTER SILLS for *your* new passenger train cars.



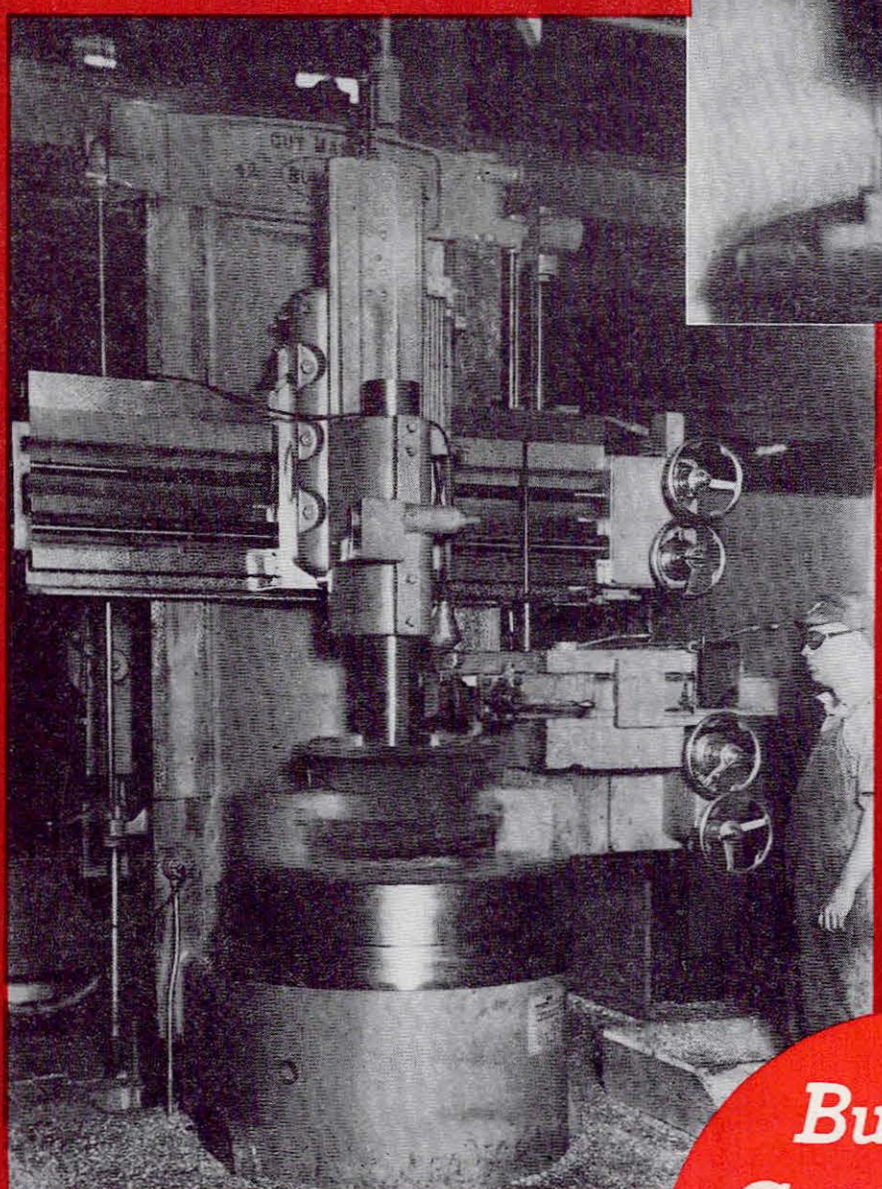
CASTINGS

EDDYSTONE, PA.
GRANITE CITY, ILL.

For Better Back Shop Reports

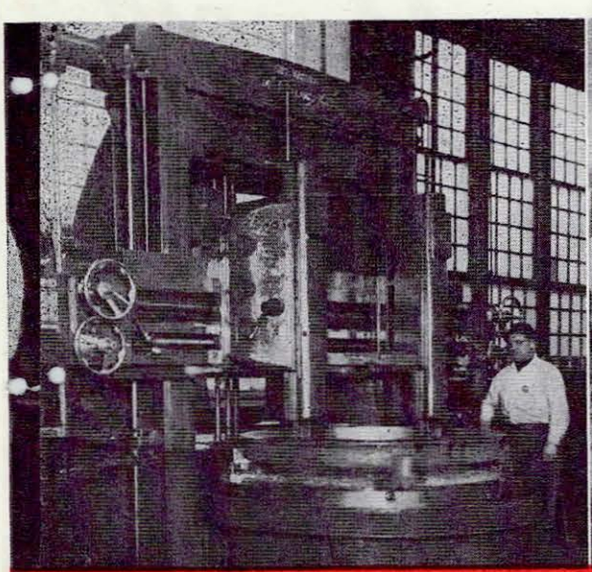


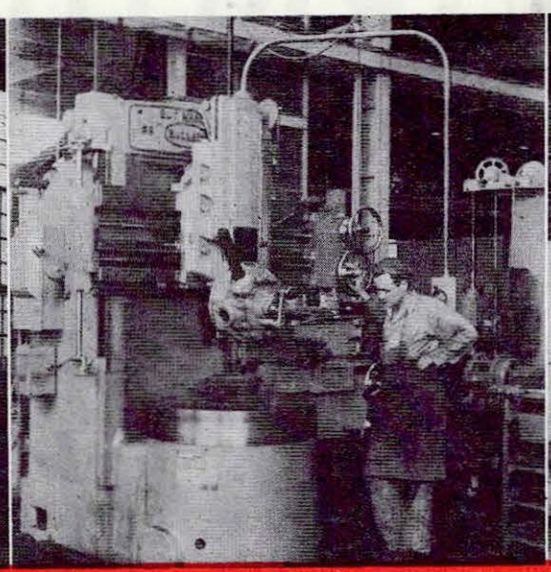
Railroads

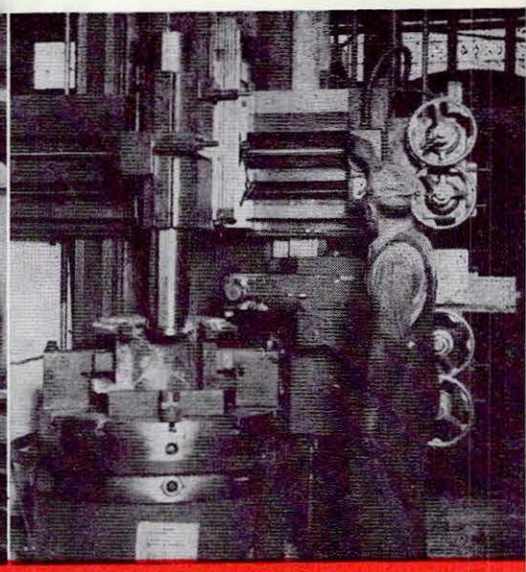


Bullard Cut Master VERTICAL TURRET LATHES

THE BULLARD







are installing BULLARD CUT MASTERS

YES! Many leading railroads are taking advantage of the cost-cutting features built into the new line of BULLARD Cut Master Vertical Turret Lathes.

These new BULLARD R. R. shop units embody the latest developments in operation with a scope that includes a range of speeds and feeds for full and efficient use of carbide tools, the necessary rigidity, accuracy, metal-removing ability and a new system of controls that will assure profitable production on all jobs.

Illustrations show some of the most recent installations: on the left page, a 42″ Cut Master Driving Box Borer which was only three days in service at the time the picture was taken and a close-up of a 36″ Cut Master machining a throttle valve seat—its first job after installation. Illustrations on this page show a 74″ Cut Master boring Tires—a general view of the 36″ Cut Master on the throttle job and another new Cut Master Driving Box Borer.

Yes! These railroads are looking for better reports from their back shops; lower production costs—greater precision and increased unit output—factors which insure faster shopping schedules. Why not back up the opinions of your mechanical supervisors and okay those requisitions for BULLARD Cut Master Vertical Turret Lathes.

COMPANY BRIDGEPORT 2, CONNECTICUT

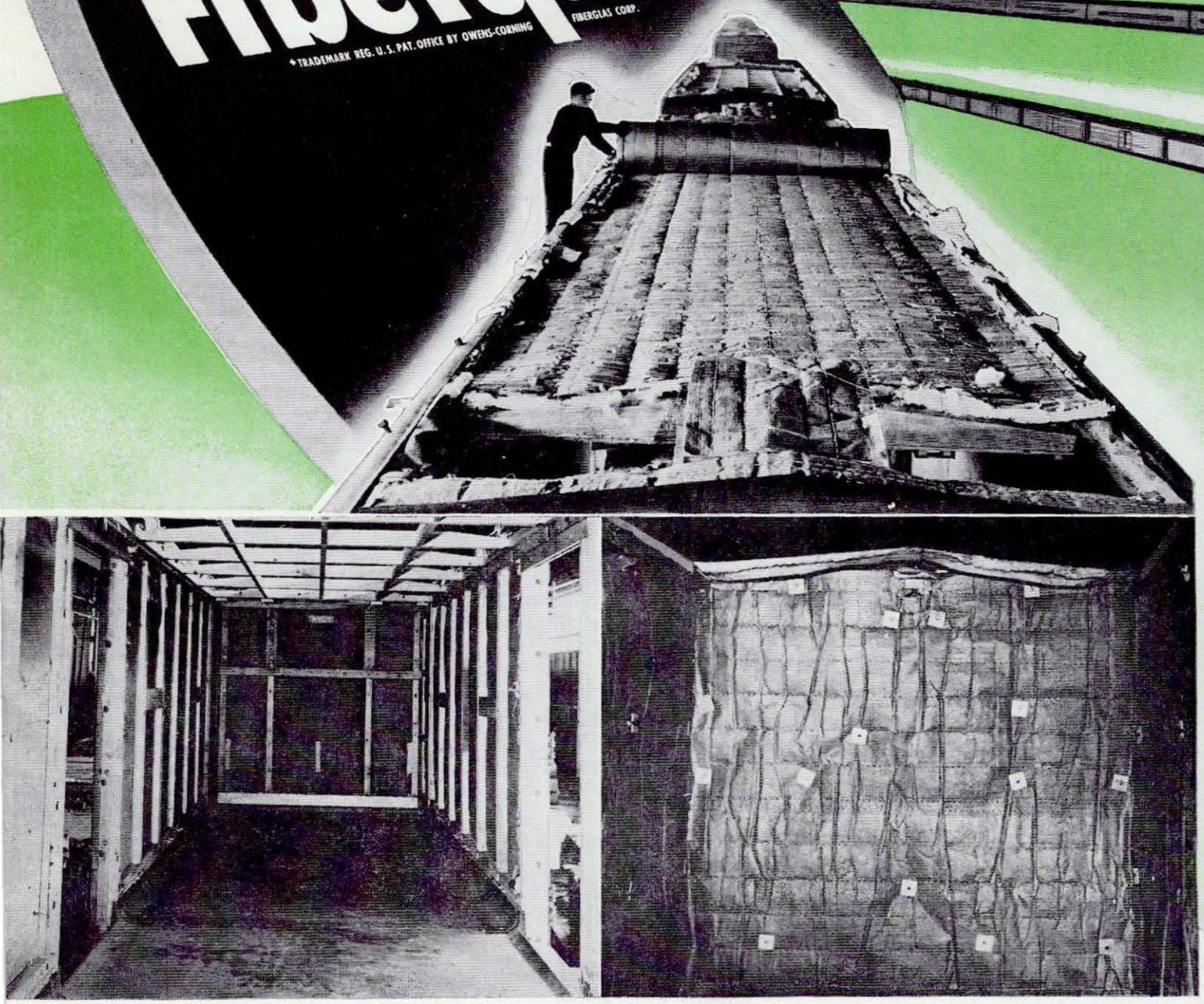
ULTRALITE

A new

Fiberglas*

FOR MODERN

*TRADEMARK REG. U.S. PAT. OFFICE BY OWENS-CORNING FIBERGLAS CORP.



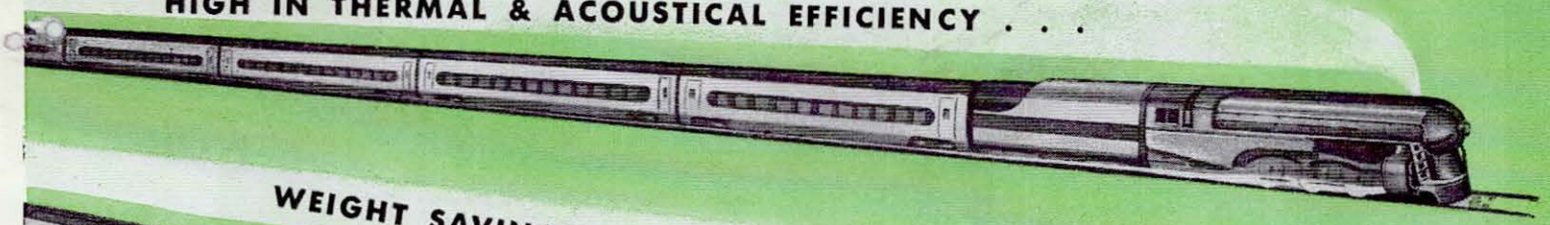
Thermal Insulation For Refrigerator Cars, Tank Cars, Passenger Cars and Locomotives

NEW YORK • PHILADELPHIA • CHICAGO • TULSA

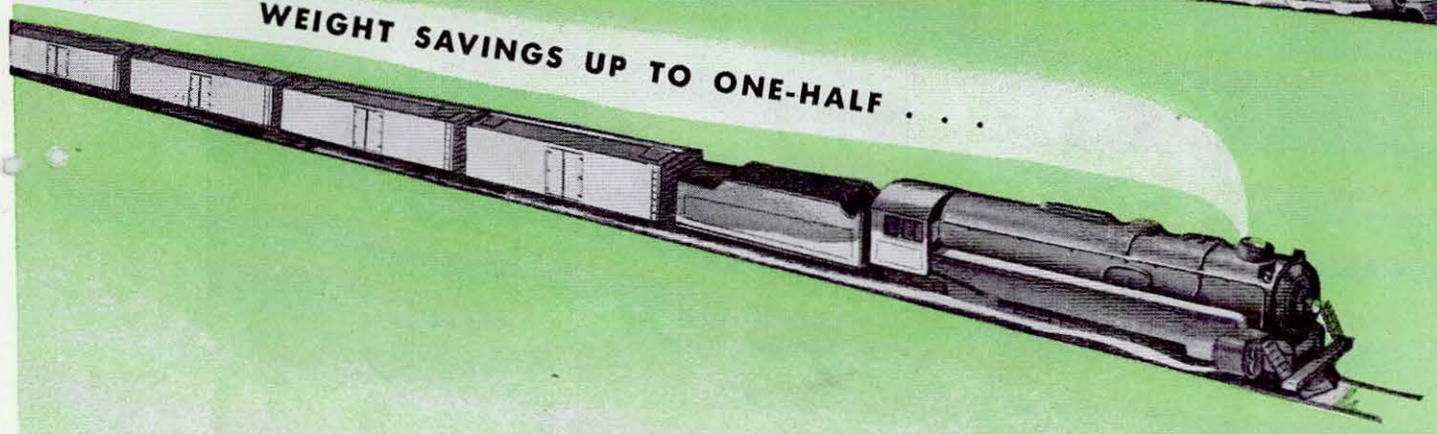
high in insulation perfection

REFRIGERATOR & PASSENGER CARS

HIGH IN THERMAL & ACOUSTICAL EFFICIENCY . . .



WEIGHT SAVINGS UP TO ONE-HALF . . .



G-B ULTRALITE Fiberglas Insulation Provides Top Insulating Efficiency with Multiple Advantages

Specifically developed as railroad insulation by the Gustin-Bacon Manufacturing Company, ULTRALITE Fiberglas Insulation has established some new standards of what modern insulation should and can do in passenger and refrigerator car service.

Saving approximately one-half in insulation weight per car—yet providing better thermal and acoustical effectiveness, G-B ULTRALITE Insulation also affords a combination of highly desired qualities hitherto unattained in any one form of railroad insulation.

Manufactured with or without facing in pliable, easy-to-handle forms for railway car installation, ULTRALITE can be applied with a minimum of labor, time and equipment. The inherent qualities of the glass fibers that make up ULTRALITE afford exceptional adaptability to railroad service. Clean and odorless with no inclination to absorb odor or moisture, they are also non-toxic and non-injurious when in contact with other substances. They are completely fire-safe, impervious to rot and deterioration, provide no sustenance for vermin, insects or rodents and will not settle or shake down under vibration. By utilizing the manifold qualities of G-B ULTRALITE Fiberglas Insulation, trouble-free, top insulating effectiveness is assured for the life of the car.

G-B MFG. CO.

ESTABLISHED 1898

Fiberglas is sold to Railroads and Car Builders Exclusively by*

GUSTIN-BACON MANUFACTURING CO.

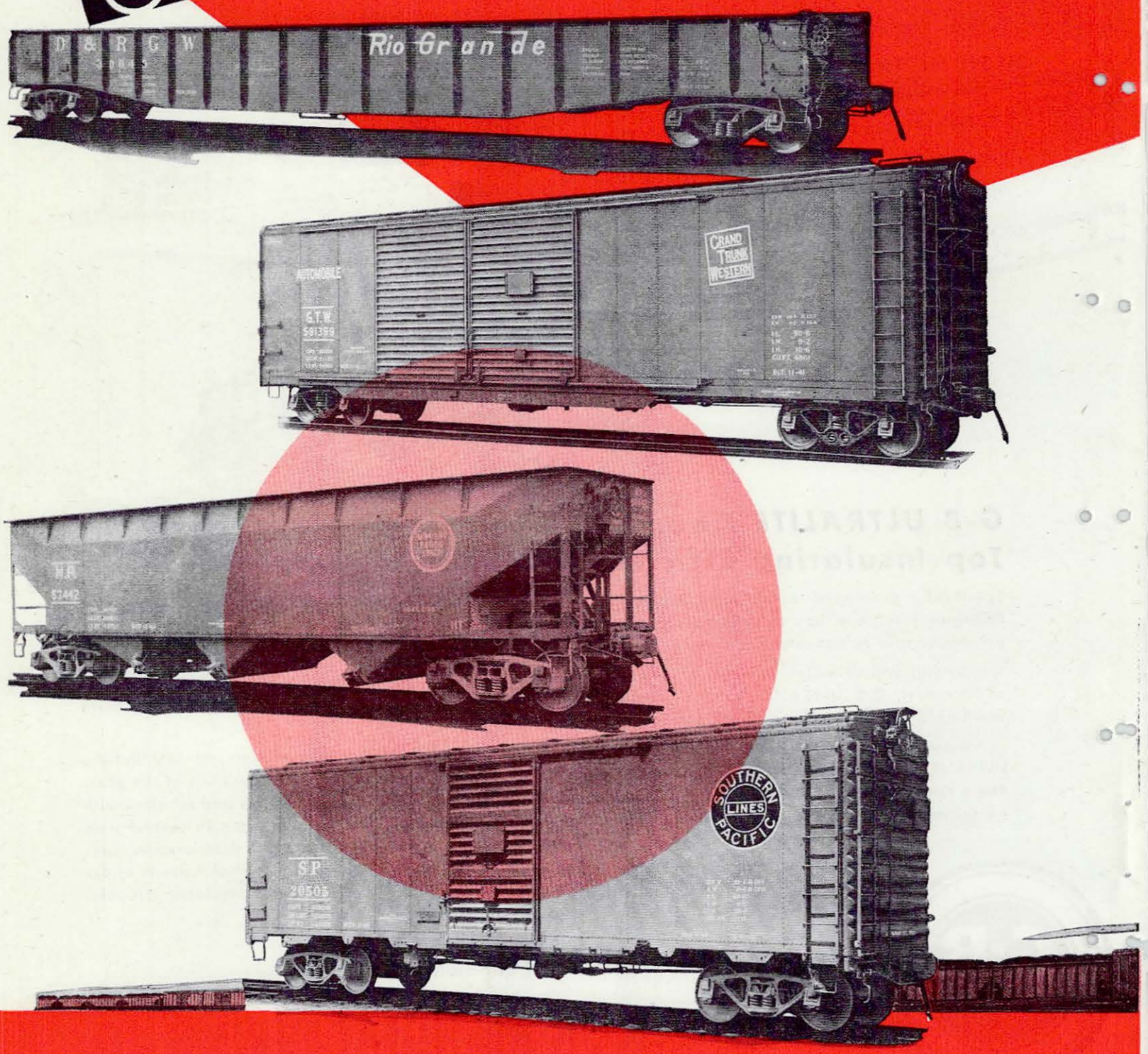
KANSAS CITY 7, MISSOURI

• HOUSTON • FORT WORTH • SAN FRANCISCO

"PRESSED STEEL'S"

Steelcar

Meeting every requirement



PRESSED STEEL CAR COMPANY, INC.

PITTSBURGH 19, PENNSYLVANIA

NEW YORK
CHICAGO
ST. LOUIS
ST. PAUL

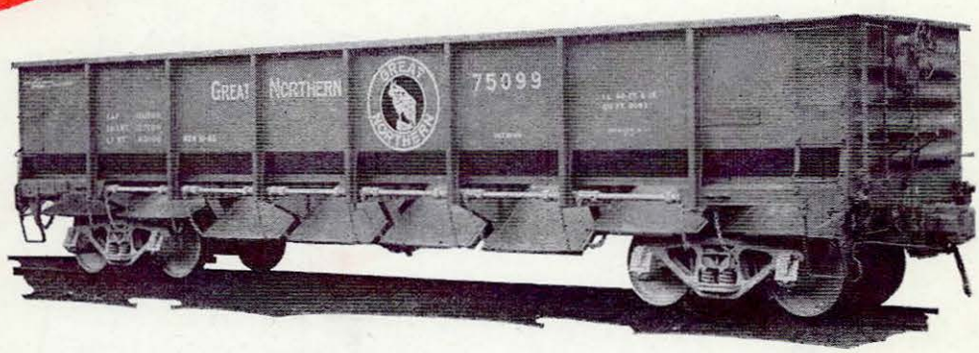
CARS...

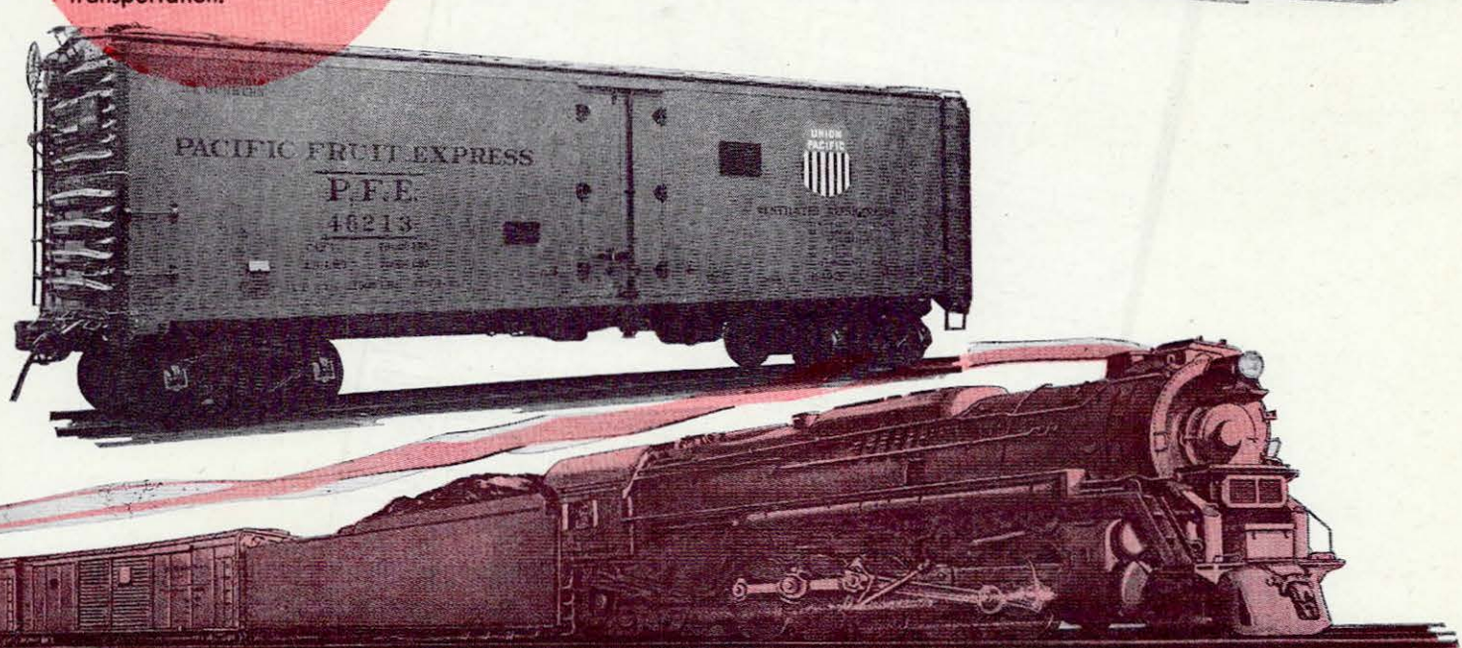
of Progressive Railroads since 1899

THE RAILROADS pioneered in the development of our Country.

PRESSED STEEL CAR pioneered in the building of the first all-steel railroad freight and passenger cars, utilizing pressed steel parts and riveted construction; pioneered, too, in the application of lightweight high tensile steels and welded construction in the building of railroad equipment.

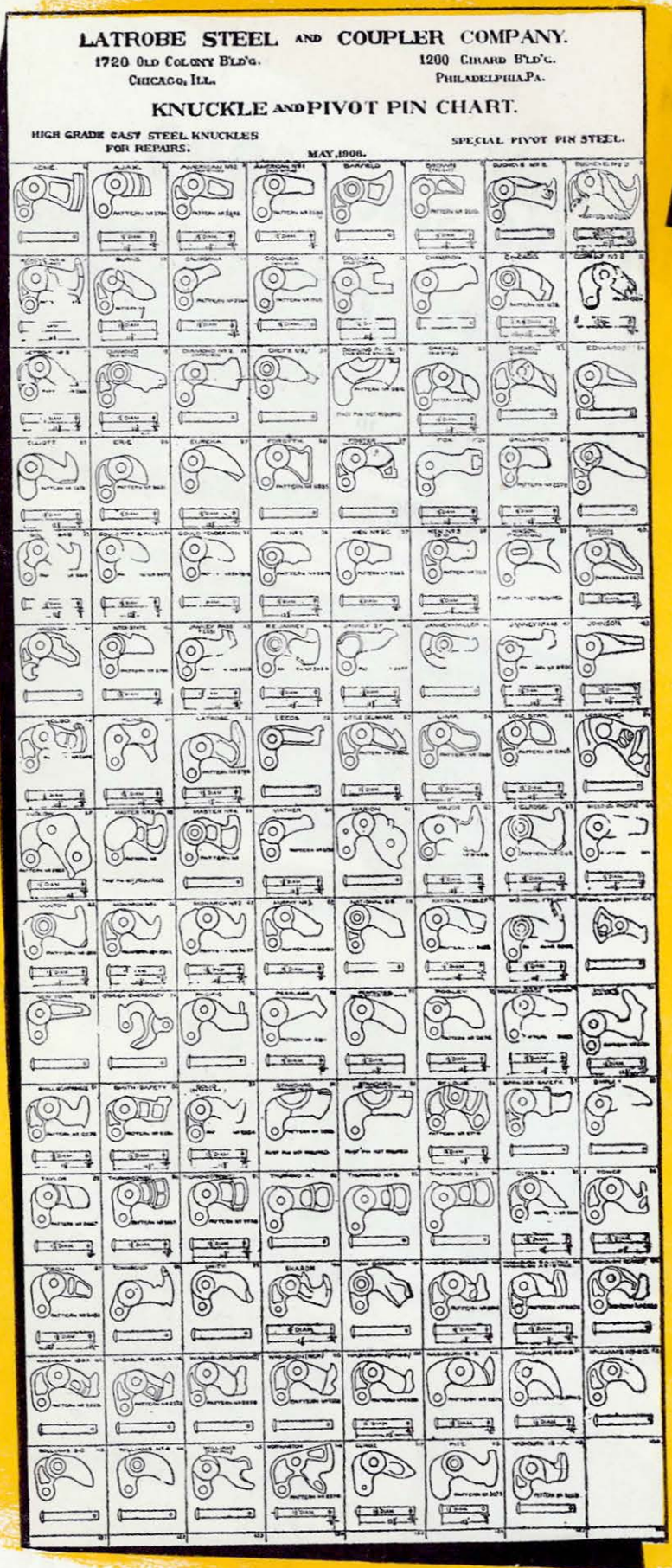
PRESSED STEEL'S engineering and manufacturing organization has always been a progressive influence in the development, designing and building of better and more efficient railroad and industrial equipment for domestic and export service in the interest of more economical, faster and safer transportation.





MT. VERNON CAR MANUFACTURING COMPANY

(Division of Pressed Steel Car Company, Inc.), MT. VERNON, ILL.



LATROBE STEEL AND COUPLER COMPANY.

1720 Old Colony B'ld'g. Chicago, Ill.

1200 Girard B'ld'g. Philadelphia, Pa.

KNUCKLE AND PIVOT PIN CHART.

HIGH GRADE CAST STEEL KNUCKLES FOR REPAIRS.

MAY, 1906.

SPECIAL PIVOT PIN STEEL.

Let's look

at the record of COUPLER development

Until the adoption of the Standard "D" Coupler, in 1916, railroad men were plagued with 119 different knuckle designs, as shown on this 1906 chart prepared by one of our predecessor companies. Acceptance of the "D" Coupler reduced knuckle designs from 119 to 1.

By 1930, further improvements in strength and operation were recognized as necessary, and the Standard "D" Coupler was redesigned as Type "E" Coupler. In 1931, it was adopted as "Standard".

Modern streamlined passenger cars, with emphasis on speed, safety and comfort, brought about, in 1944, the development of the Tightlock Coupler which eliminates practically all coupler slack and includes new safety interlocking features.

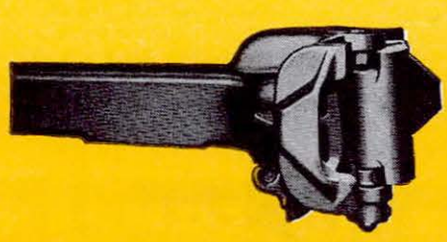
"National" has taken a leading part in all these costly developments. Our engineers work constantly with railroads, car builders and other manufacturers to originate, build and test equipment for faster, safer train operation.

All of our facilities and personnel have always been at the service of the industry . . . and our leadership in advancing improvements will be maintained.

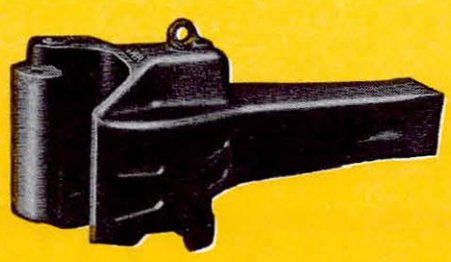
M&S Co.
EST. 1868

NATIONAL
MALLEABLE AND STEEL CASTINGS COMPANY
Cleveland, Ohio

Sales offices: **Cleveland, Chicago, New York, Philadelphia, Richmond, St. Louis, San Francisco.**
Works: **Cleveland, Chicago, Indianapolis, Melrose Park, Ill., Sharon, Pa.**



A. A. R. Tightlock Coupler



A. A. R. Standard "E" Coupler

Adaptability Unlimited

BUTLER BUILT

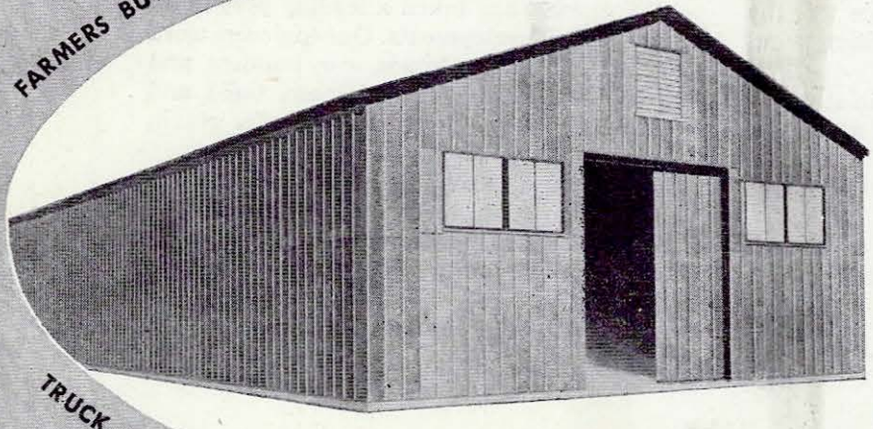
Reg. U.S. Pat. Off.

RIGID FRAME (Trussless) STEEL BUILDING

FARMERS BUTANE SERVICE

SUPPLY STORE

TURBINE PUMP COMPANY



TRUCK GARAGE

STANDARD SIZE
40 FT. WIDTH
14 FT. HIGH SIDEWALLS
100 FT. LENGTH

●

OPTIONAL LENGTHS

The standard length may be varied in multiples of 20 ft. for buildings more or less than 100 ft. in length.

POTATO WAREHOUSE

TIRE SHOP

The Greatest Improvement in Industrial Steel Building Design in Years

Illustrated are but a few of the practically innumerable adaptations of this popular BUTLER prefabricated Industrial Steel Building. It is furnished in a standard 40′ x 100′ size complete as shown in the center photo. *Due to the unusually simple design and assembly, buyers and their contractors have found it practical and economical to make their own modifications to suit particular requirements.*

Sturdily fabricated—these weather-tight steel buildings are permanent structures, yet have the advantage of being easily dismantled and re-erected at another location if necessary. The Rigid Frame (trussless) Construction permits maximum use of interior space with more than adequate structural strength provided.

Complete specifications and shipping data will be promptly furnished upon request. Delivery schedules subject to availability of steel.

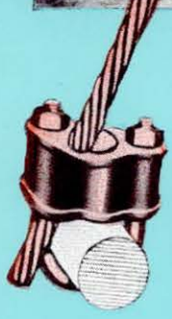
BUTLER MANUFACTURING COMPANY

FACTORIES: KANSAS CITY GALESBURG MINNEAPOLIS

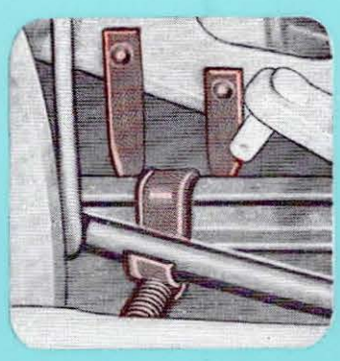
SALES OFFICES: 1334 E. 13th STREET, KANSAS CITY 3, MO. • 934 SIXTH AVE. S. E., MINNEAPOLIS 14, MINN

Home of GRIP NUT COMPANY Products

The Safety Way is the "Grip Nut" Way!

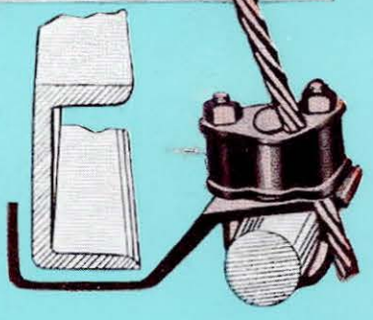


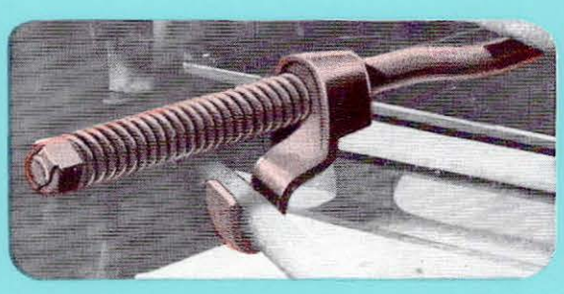
LEAK-PROOF BOLT



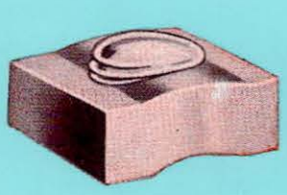
GRIPCO SPECIAL
Brake Beam Safety Support
For Spring-plankless Trucks

UNIVERSAL
Brake Beam
Safety Support

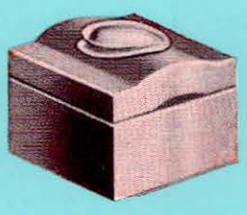




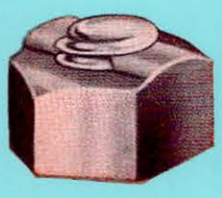
GRIPCO
Brake Beam Safety Support



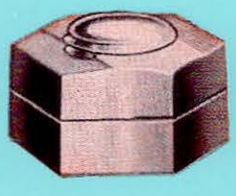
GRIP HOLDING NUT, No. 2
(Locking or Free Spinning)



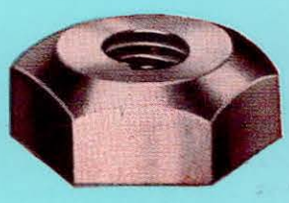
GRIP LOCK NUT, No. 1



GRIP UNIT NUT, No. 3



GRIP LOCO NUT, No. 4



SPECIAL FRONT
END NUT

Grip Nut Products are Patented

GRIP NUT COMPANY
310 SOUTH MICHIGAN AVENUE, CHICAGO 4, ILLINOIS

Serving American Railroads since 1906

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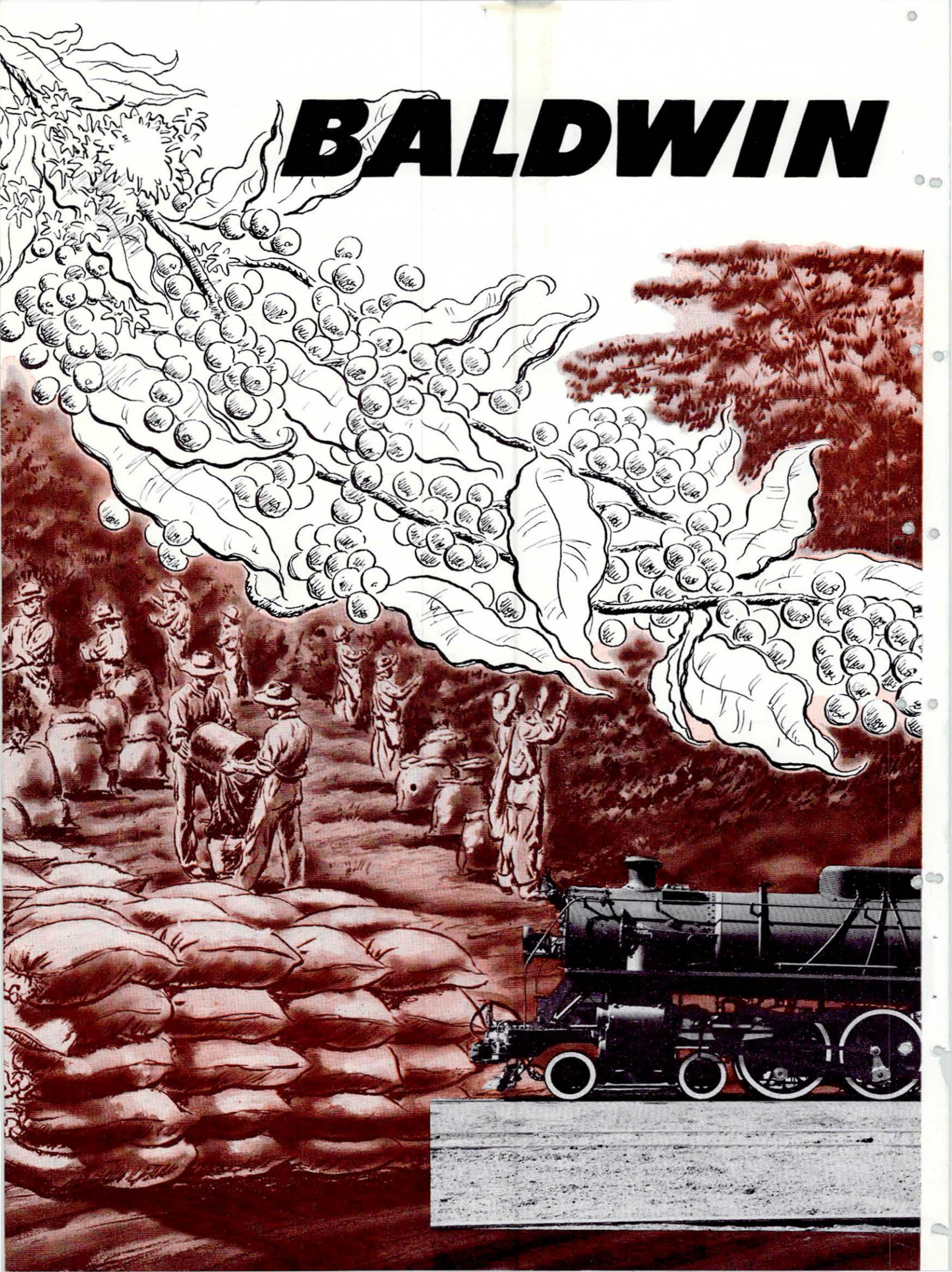

BALDWIN

helps our largest Southern Neighbor fill the World's coffee cup

You probably had Brasil to thank for that morning cup of coffee, because from two-thirds to three-fourths of the entire world's supply comes from this South American Republic. Greater in land area than the United States, Brasil is said to possess a larger proportion of land for the support of life and productive industry than any other nation.

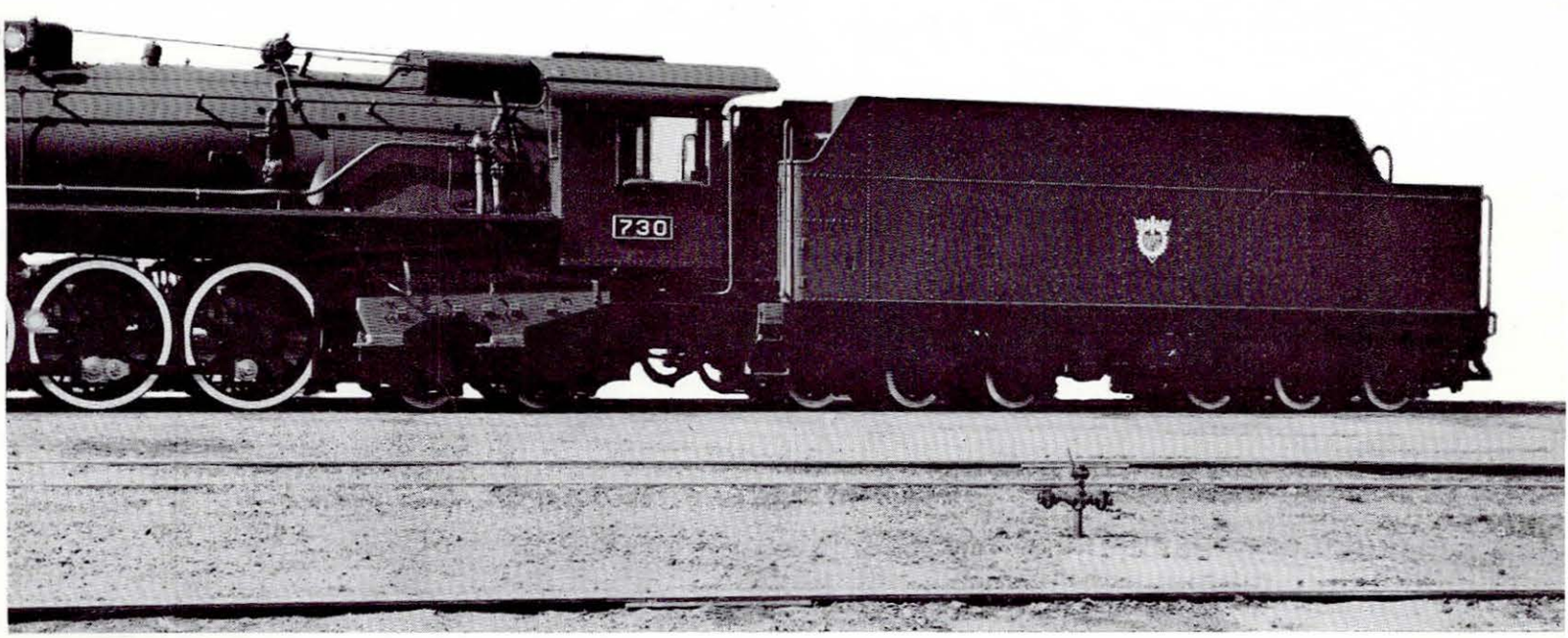
Brasil has been a Baldwin customer since the year 1862. A recent order comprised ten 4-8-4 type locomotives, one of which is shown below, for the Ministry of Communications and Public Works of Brasil.

Baldwin locomotives are helping to modernize, rehabilitate, and extend rail transportation all over the world. When you need locomotives, the experience gained in turning out a unit every fourteen hours for over a century is waiting to serve you.

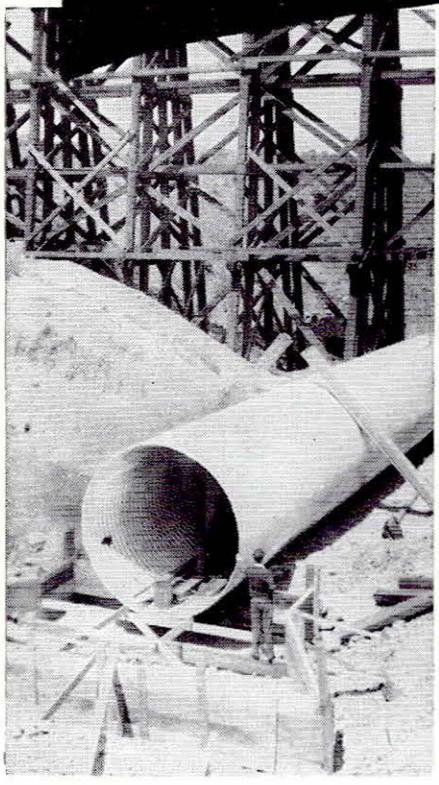
The Baldwin Locomotive Works, Philadelphia 42, Pa., U. S. A. Offices: Philadelphia, Chicago, St. Louis, Washington, New York, Boston, San Francisco, Birmingham, Houston, Cleveland, Detroit, Pittsburgh, Norfolk.

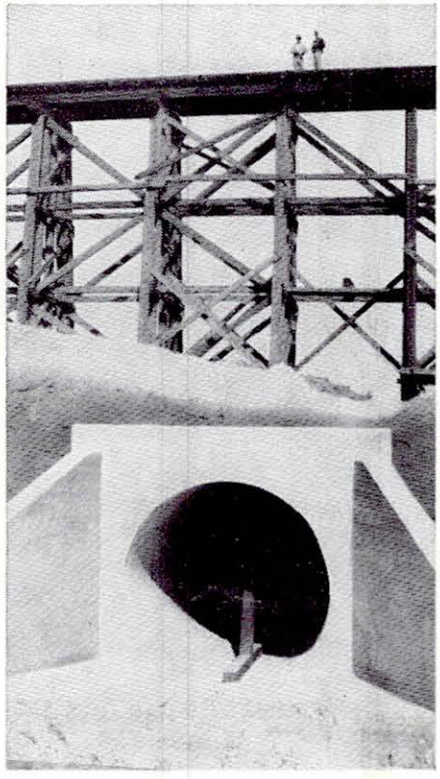
BLW THE BALDWIN GROUP

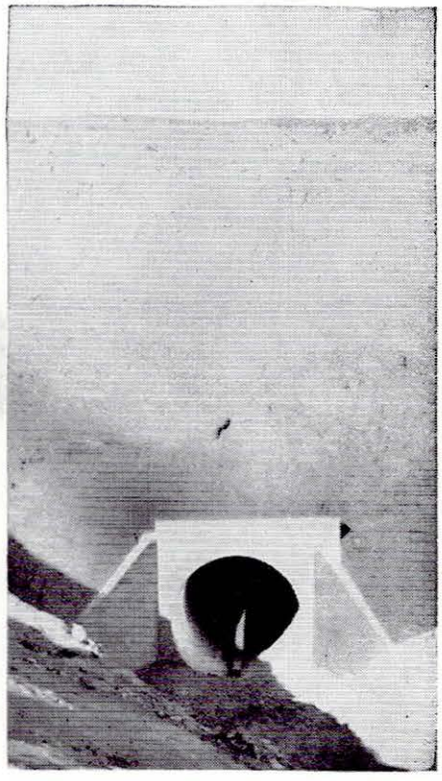
BALDWIN



This is the simple, practical answer *to excessive bridge repairs*







The maintenance superintendent of a main-line railroad rebuilds with ARMCO MULTI PLATE whenever a budget-eating trestle or bridge becomes unsafe.

It's easy to see why he relies on MULTI PLATE for new bridge jobs or replacements. Using these rugged structures, bridges can be "relined" or replaced without interrupting traffic. Unskilled men can assemble the curved plates quickly, bolt them together, and then backfill. Any kind of headwall design may be used with this adaptable material.

Learn how quickly you can repair or replace troublesome drainage structures with ARMCO MULTI PLATE. You'll be ahead on your modernization program if you plan now on using MULTI PLATE. Write to Armco Drainage & Metal Products, Inc., 1265 Curtis St., Middletown, Ohio.

Export: The Armco International Corporation

Armco Multi Plate

MULTI ARMCO PLATE

A PRODUCT ORIGINATED AND DEVELOPED BY ARMCO ENGINEERS

SYPHON LOCOMOTIVES ARE BETTER

CHICAGO & NORTH WESTERN TAKES IMPROVEMENT PROGRAM IN STRIDE!

First of 35 H Class locomotives thoroughly rebuilt and modernized. Reported equivalent of new power well adapted to modern heavy high speed passenger and freight service (Detailed description in Railway Age of April 27, 1946).

James W. Sandy, for 57 years a boilermaker in the locomotive shops of the Chicago and North Western Railway, christens the 4-8-4 Class H-1 steam locomotive. Looking on is machinist A. R. Olson also with 57 years' service.

The locomotive is the largest and most powerful steam engine in North Western service and is cross-balanced for 90 miles per hour speed.

28,384 SYPHONS IN 12,114 LOCOMOTIVES ON 194 RAILROADS

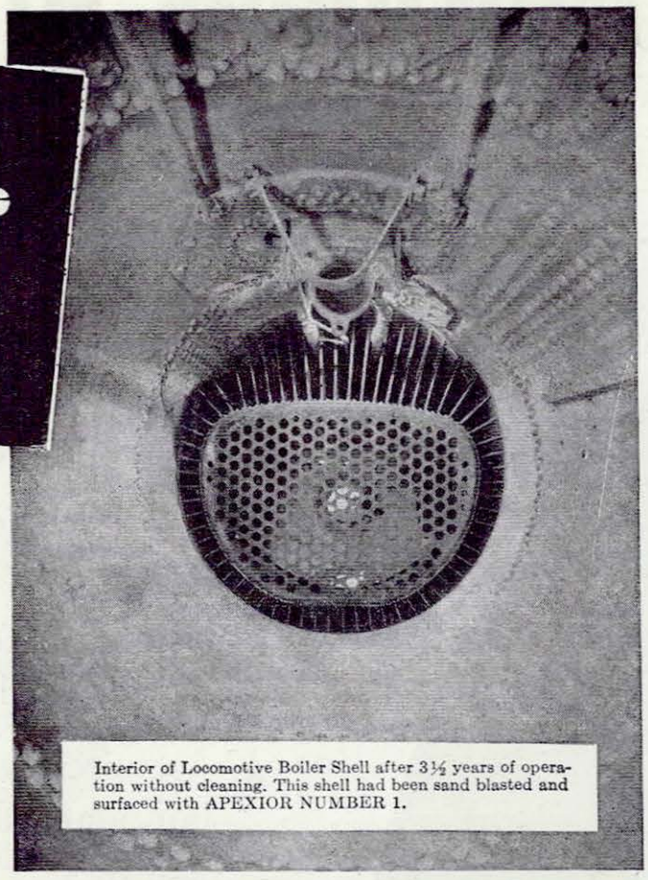
A new all-welded firebox with two Thermic Syphons in the firebox and two in the combustion chamber.

Locomotive Firebox Company

PHILADELPHIA CHICAGO MONTREAL

APEXIOR SURFACING INCREASES OPERATING PROFITS TWO WAYS

1. Lengthens Life of Boiler Metal
2. Shortens Locomotive Shop Time



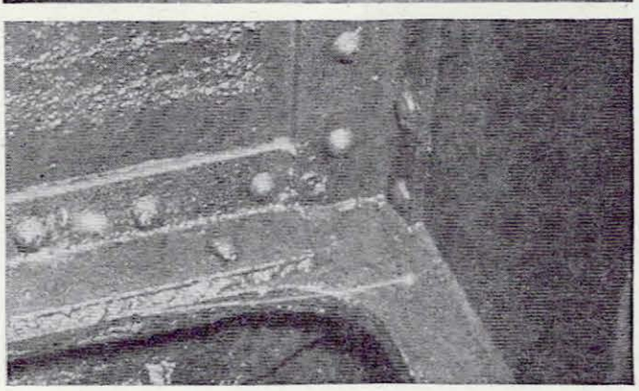
Interior of Locomotive Boiler Shell after 3½ years of operation without cleaning. This shell had been sand blasted and surfaced with APEXIOR NUMBER 1.

That the use or non-use of APEXIOR can make a noticeable difference in your profit sheet may appear to be overemphasis of a maintenance detail. But figure it out for yourself.

A brush-applied protective coating of APEXIOR NUMBER 1, a few thousandths of an inch thick, prevents water or steam from contacting the metal of locomotive boiler shells and other surfaces exposed to boiler water and steam. That's why it effectively retards or checks corrosion and pitting in boilers . . . minimizes the hazards of embrittlement or accelerated stress corrosion. Naturally, that lengthens boiler life . . . postpones indefinitely investment in costly replacement parts.

Moreover, APEXIOR NUMBER 1 retards formation of scale . . . prevents adherent bonding with the metal. Whatever scale does adhere comes off easily. And because an APEXIORIZED surface remains smooth, boiler deposits have little to cling to . . . so, flush away easily . . . Boiler washing is more effective. That means that locomotives spend less time in the shop . . . more time carrying payloads.

APEXIOR NUMBER 1 is applied in thousands of locomotive boilers subject to Interstate Commerce Commission inspection.



APEXIOR NUMBER 3

See how this brush-applied, durable coating protects the water space of locomotive tenders. It air-dries to a chemically inert, shiny-black film, resistant to water, moisture and chemicals used in water-conditioning. It does not affect potability of water. Picture shows interior of tender cistern 21 months after surface at right was coated with APEXIOR NUMBER 3. Corroded surface at left was not coated, for comparative test.

See *Locomotive Cyclopedia*. And write for Bulletin.

APEXIOR

Keeps new metal new . . . Gives old metal new life

DAMPNEY

THE DAMPNEY COMPANY OF AMERICA
Hyde Park, Boston 36, Mass.

Please send free Bulletin.

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Company.....

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Workin' on the Railroad Since '86

Sixty years may be just the beginning—that is how we feel at Safety Company, where "workin' on the railroad" is no figure of speech . . . we do it actually.

In addition to designing and manufacturing Safety Company car lighting, generator and air conditioning equipment, Safety Company engineers and maintenance men have serviced our equipment in use for many of America's leading railroads.

This practical field experience—working on the railroad—is reflected on our design boards by progressive improvements to equipment. It is reflected in our manufacturing methods and processes. And it is reflected to you thru performance that adds up to long life and higher efficiency from Safety Company equipment.

Our sixty years *workin' on the railroad* is assurance that you get the best when you *"STANDARDIZE WITH SAFETY."*

THE SAFETY CAR HEATING AND LIGHTING COMPANY INC.

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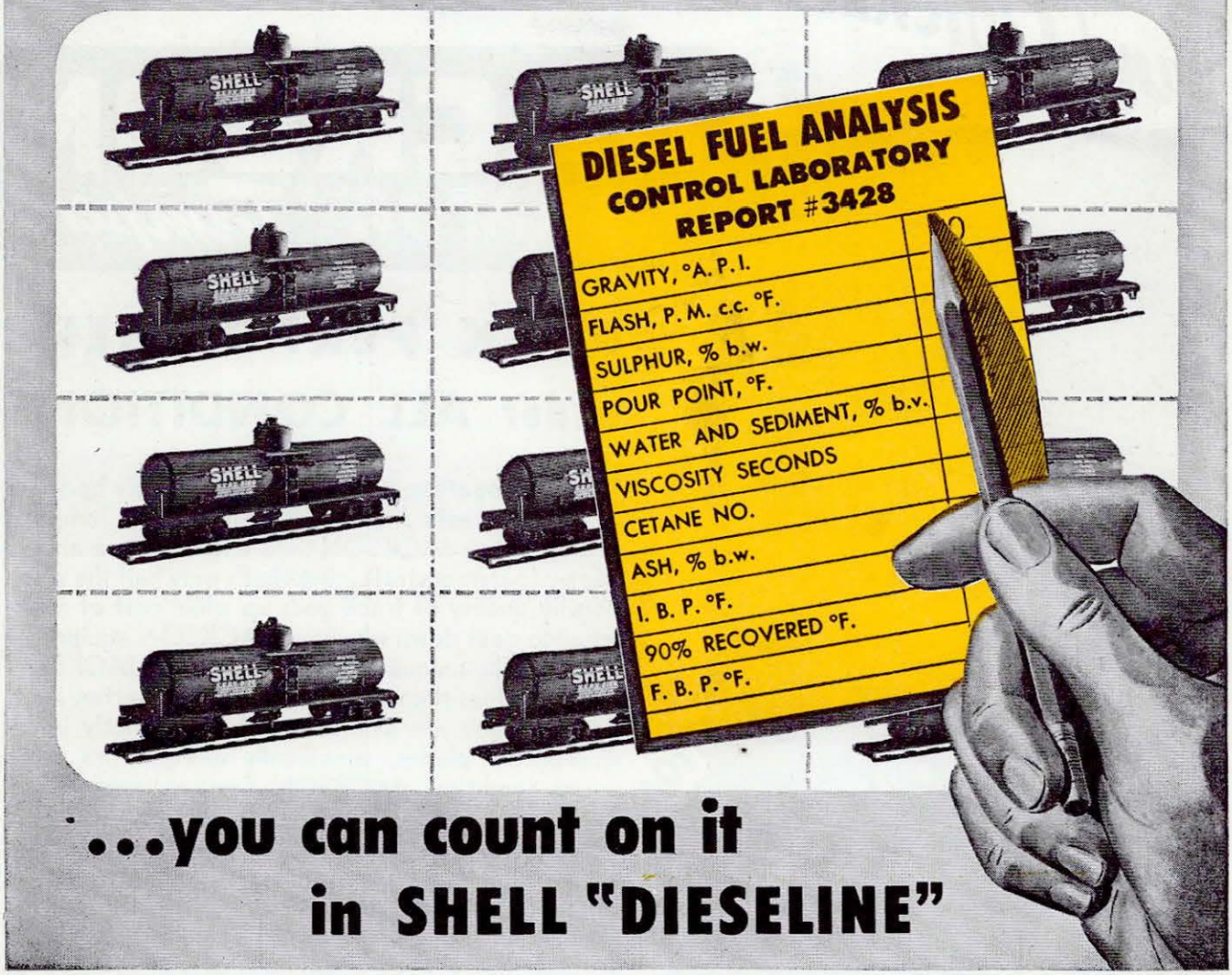


...you can count on it in SHELL "DIESELINE"

ANALYSIS OF SHIPMENTS of Shell "DIESELINE" will reveal its month-after-month, year-after-year uniformity. It's this uniformity that enables Diesel operators to tune an engine's fuel injection system to that fine point which brings maximum economy—and to *hold it there.*

This same demand for unvarying quality causes Diesel manufacturers to be particular about the fuel they use in engine testing—and why so many prominent makers have standardized on Shell "DIESELINE"—not just for the past year or two, but for ten, and, in the case of one of the leading engine makers, for *twelve consecutive years!*

Try this modern quality fuel in your engines for a month or two. Keep records and compare with the results you've been getting. Very likely you will be surprised at the top-notch, *consistent* performance you get from Shell "DIESELINE."

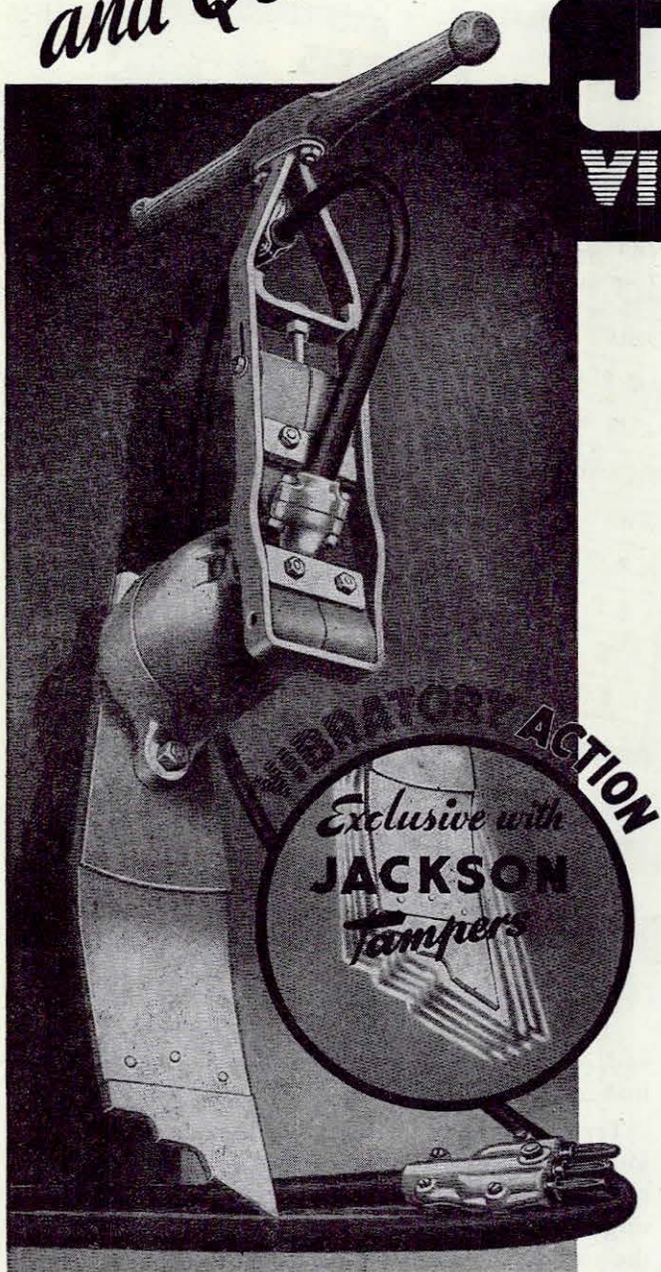
For more information about Shell "DIESELINE" and other Shell Fuel Oils, write to Shell Oil Company, Incorporated, 50 West 50th St., New York 20, N.Y.; or 100 Bush St., San Francisco 6, California.

SHELL DIESEL FUELS

SHELL

VIBRATORY ACTION and QUICKLY INTERCHANGEABLE BLADES MAKE

JACKSON VIBRATORY Tampers



PEAK PERFORMERS under ALL CONDITIONS

THAT smoother, firmer, longer-lasting tie beds are obtained with JACKSON Vibratory Tie Tampers, is a fact that JACKSON field engineers are always happy to demonstrate. But that's only half the story of why quality of track goes up while cost of maintenance goes down wherever JACKSON equipment is used. The unique vibratory action of JACKSON Tampers does the work faster as well as better. And, because they are available with five quickly interchangeable blades, specifically designed to meet every condition, JACKSON Tampers perform at peak efficiency in ALL BALLASTS, in ALL LIFTS and in every surfacing or tamping operation in which tampers may be used, including "Spotting," "Cribbing-out," etc.

Conclusive proof of these claims is clearly evident in the fact that more than 4 out of 5 of the leading roads have standardized on JACKSON equipment. Which suggests that if you are not already a user, you investigate this time and money-saving equipment at once. We will gladly send you complete information or arrange for a demonstration. Write, NOW.

U-607
Does a job that no other tool will do in crushed granite, trap rock, or slag. Prevents locking up before compaction completed.

1-2A
(left and right)
Most universally used for all operations in gravel, slag or 1½" to 2" stone, including "Spotting." Point acts as pick for opening hole beneath tie.

U-606
Tip is 6" wide. Not a spotting blade, except in light ballasts, but very efficient in all ballasts from cinders to 2" rock, depending on lift.

U-600
Known as the "crammer." Amazingly fast in placing gravel and lighter ballasts in 2" to 8" or 10" lifts; also efficient in crushed material of small to medium size where lift is moderate to high.

U-609
For removing badly cemented ballast in tie renewal or skeletonizing operations, removing ice around the track or grading work in frozen ground this blade really does a job.

ELECTRIC TAMPER & EQUIPMENT CO., Ludington, Michigan

Longer Car Life

STARTS HERE

Two Ways for Car Designers to Step Up Endurance and Boost Payload!

Despite advances in design and materials in other industries, there has been little change in freight car equipment since the advent of the steel car. There has been some spot welding, but riveting, especially in hopper cars, continues to predominate even though riveted lap joints and riveting straps inevitably form serious corrosion traps.

And while copper-bearing steel frequently has been substituted for ordinary steel, it does not solve the corrosion problem. Neither do extravagant corrosion allowances and high safety factors which have been largely responsible for the *steady increase in ratio of deadweight to payload during the past twenty years.*

Thus, the designer of today has an excellent opportunity to stretch car life, to increase payload and to lighten the burden of deadweight, all at one and the same time through (1) improved design and improved methods of fabrication, and (2) Republic High Strength Steels.

To enable car designers and builders to realize greatest benefits, Republic produces three *different* High Strength Steels —Republic ALDECOR, Republic COR-TEN and Republic DOUBLE STRENGTH —in sheets, strip, plates and bars. And Republic's metallurgical staff is ready to work with you in replacing obsolete, cumbersome equipment with stronger, lighter cars of all types.

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MOLY

So Simple...

IT'S SOMETIMES OVERLOOKED

Coil springs, in hand scales or freight car trucks, react in *exactly* the same way. For each additional unit of weight, the springs are compressed an additional unit of distance. For each unit of weight removed, the springs recoil an equivalent amount.

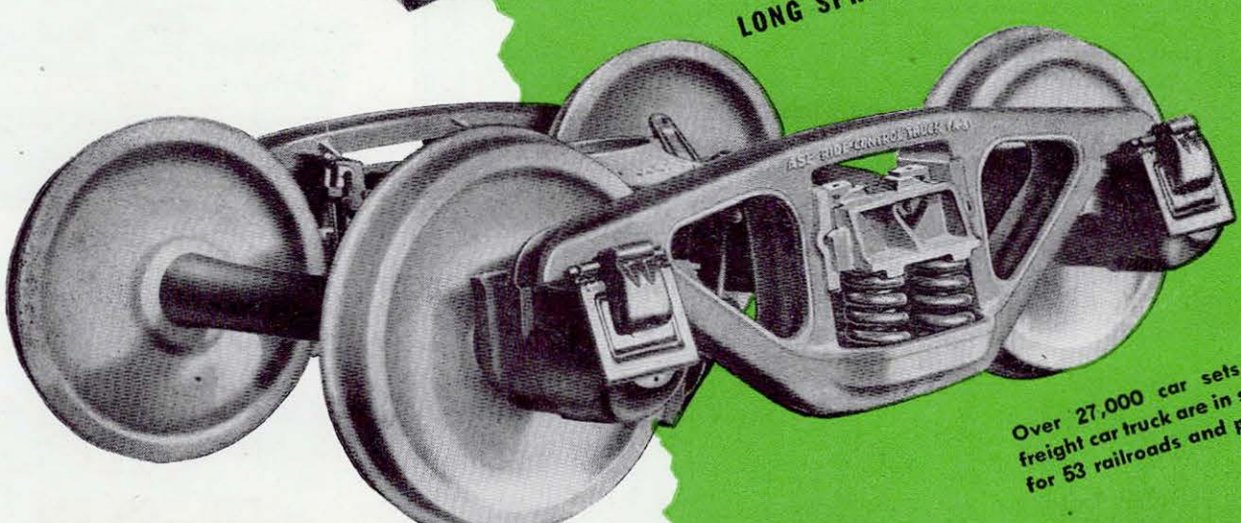
That's why coil springs in freight car trucks are best controlled by constant resistance that is uniform throughout full spring travel, *both up and down*. Only in this way can maximum freedom of movement be preserved for natural cushioning effect.

This is the principle of *Ride-Control* . . . soft, long-travel springs *plus* constant friction control that cushions all bolster motion—up, down, across-track. Millions of miles of better freight car service have proved and reproved that A.S.F. Ride-Control Trucks cut maintenance on rolling stock and roadbed; give lading an easy ride.

A·S·F *Ride-Control* TRUCK (A-3)

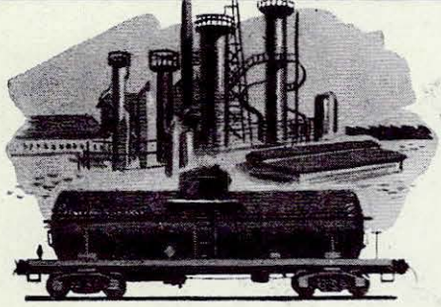
NO SPRING PLATES—NO SPRING PLANKS

LONG SPRING TRAVEL • CONSTANT FRICTION CONTROL



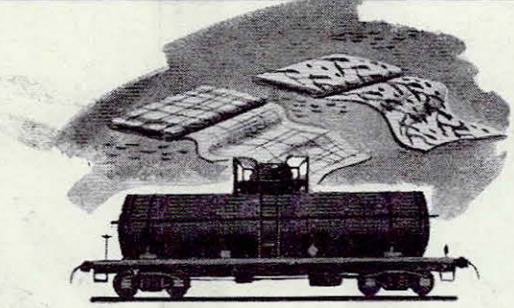
Over 27,000 car sets of this modern freight car truck are in service or on order for 53 railroads and private car owners.

AMERICAN STEEL FOUNDRIES



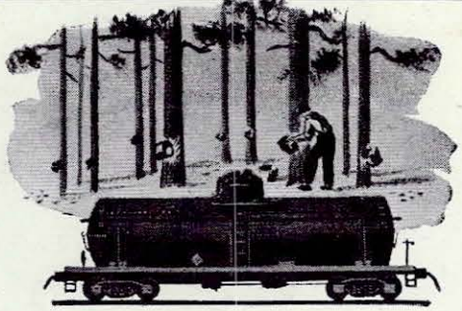
ALCOHOL

Clean, steel car, 6,000 to 10,000 gallon capacity.



CAUSTIC SODA

Heavily insulated steel car, with or without heater coils, 8,000 or 10,000 gallon capacity. Usually specially lined.

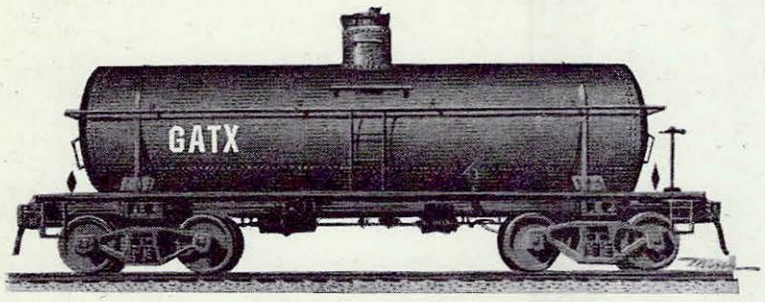


TURPENTINE

Clean steel car; 6,000 to 8,000 gallon capacity.

FOR RENT

TANK CARS



Tank car transportation of liquids in bulk, pioneered by General American has proved its versatility, its efficiency, its economy.

The General American fleet comprises more than 37,000 specialized tank cars . . . 207 different types of tank cars . . . designed for the safe and swift hauling of an almost infinite variety of liquids.

General American's strategically located offices, plants and repair shops keep these tank cars at your service, provide you with precisely the type of tank cars you want, *where* you want them.

• • •

If your problem is the transportation of liquids in bulk, let the nearest General American office help you.

GENERAL AMERICAN TRANSPORTATION CORPORATION

GENERAL OFFICE: 135 South La Salle Street • Chicago 90, Illinois

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St. Louis	Houston	Pittsburgh
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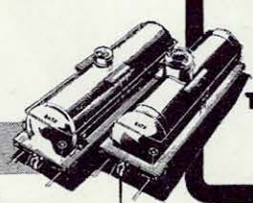
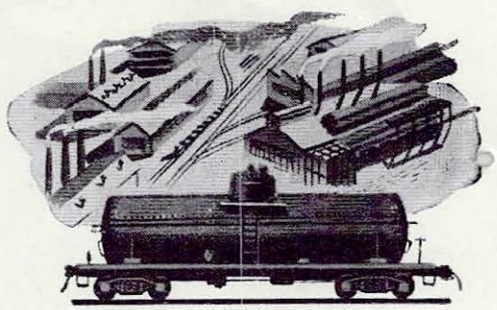
Los Angeles		

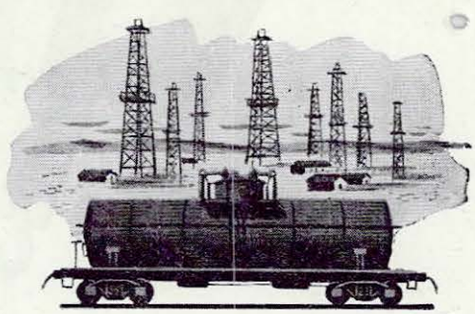


GENERAL AMERICAN TRANSPORTATION CORPORATION CHICAGO



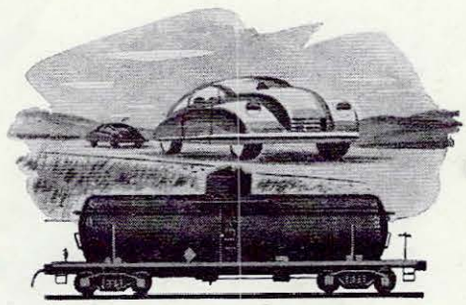
FUEL OIL

Steel car, steam coiled, 8,000 to 12,500 gallon capacity.



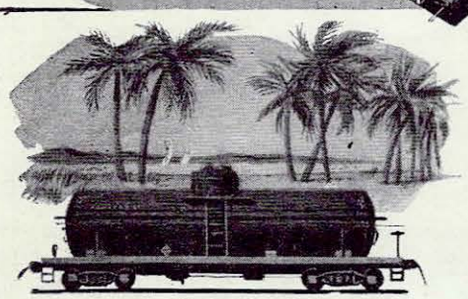
MURIATIC ACID

Car lined with pure or synthetic rubber; 8,000 to 10,000 gallon capacity.



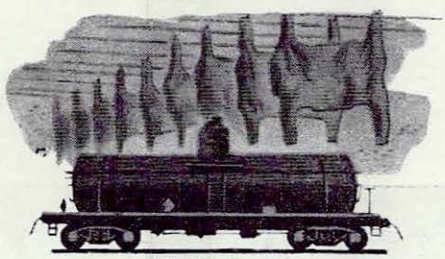
GASOLINE

Clean car, 6,000 to 12,500 gallons; single or multiple compartment



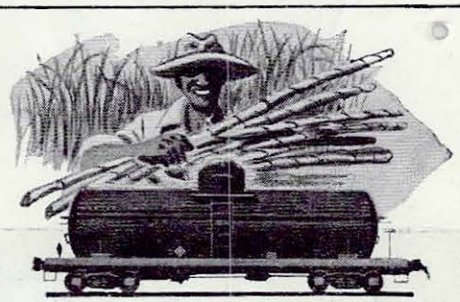
COCONUT OIL

Clean steel car, with steam coils, usually 8,000 gallon capacity.



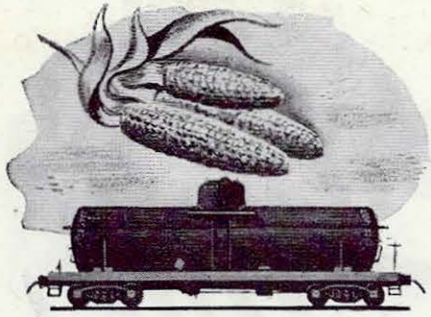
TANNIC ACID

Equipped with brass coils and interior lined with a resinous, plastic or asphaltic material.



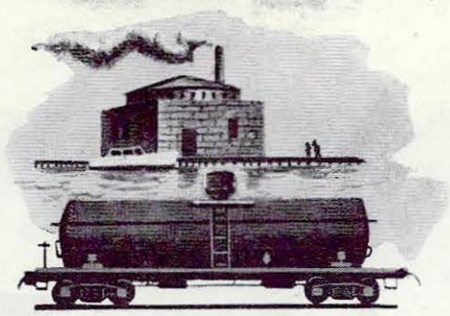
MOLASSES

Steam-coiled car with heavy capacity trucks; 8,000 gallon capacity.



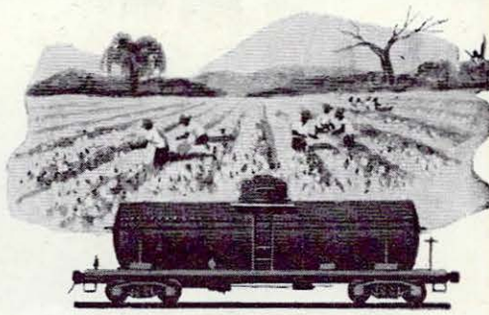
CORN OIL

Clean, steam coiled car.



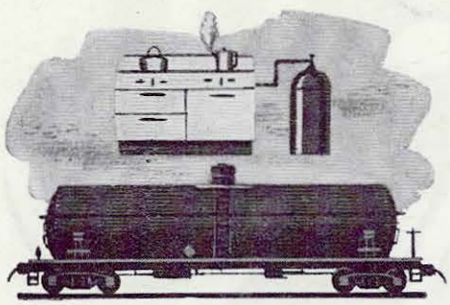
CHLORINE

Insulated, welded car; built to withstand pressure up to 500 pounds; 15 or 30 ton capacity.



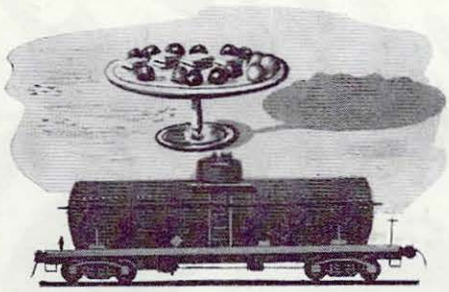
COTTONSEED OIL

Clean, steam coiled car of 8,000 gallon capacity.



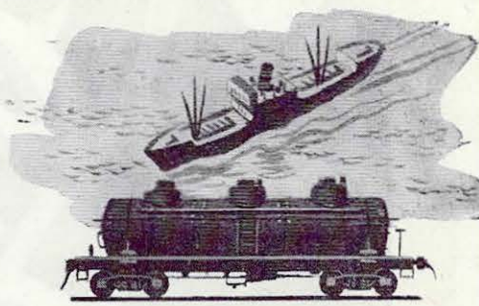
PROPANE

Heavily constructed car, welded and insulated. Built to withstand internal pressures to 300 pounds. Capacity 10,000 to 11,000 gallons.



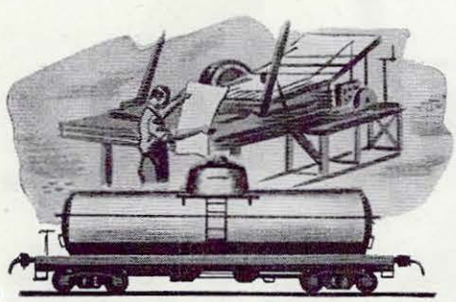
CORN SYRUP UNMIXED

Clean, steam coiled with heavy truck capacity. Usually lined with aluminum paint.



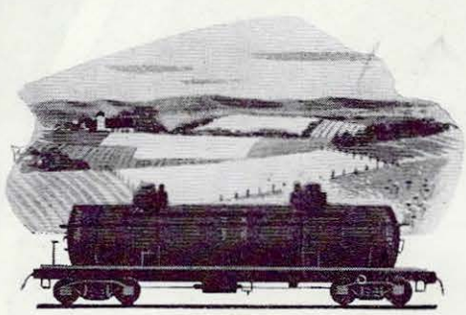
LUBRICATING OIL

Steel car, with steam coils, single or multiple compartment; usually 8,000 gallon capacity.



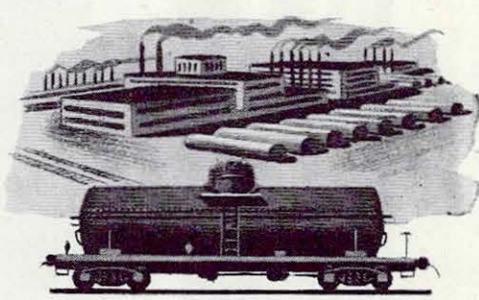
ACETIC ACID

Aluminum Car, 8,000 or 10,000 gallon capacity.



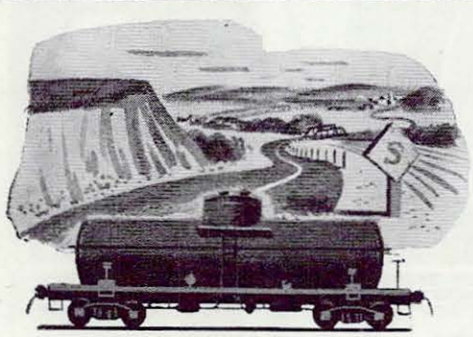
LINSEED OIL

Steel car equipped with steam coils; single or multiple compartment, usually 8,000 gallon capacity.



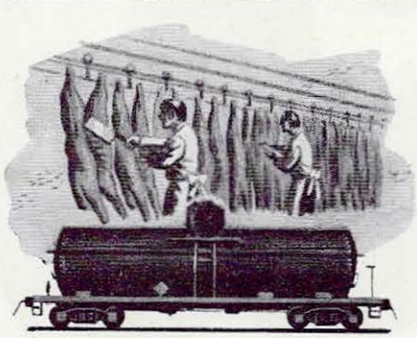
BENZOL

Clean car, with steam coils; 8,000 to 12,500 gallon capacity.



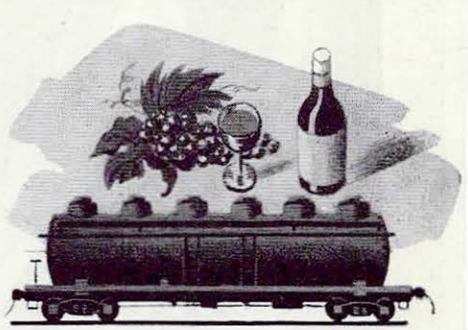
ASPHALT OR TAR

Heavily steam coiled car; with 2 or more inches of insulation; steam jacketed outlet; 8,000 to 10,000 gallon capacity.



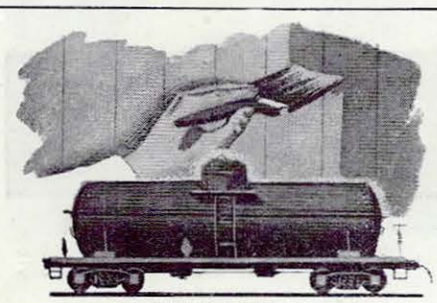
LARD

Clean steam coiled car, usually of 8,000 gallon capacity



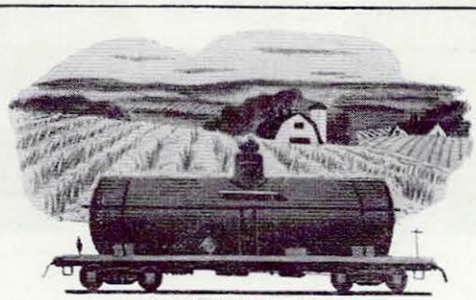
WINE

Insulated car with one to six compartments. Interior coated to preserve quality.



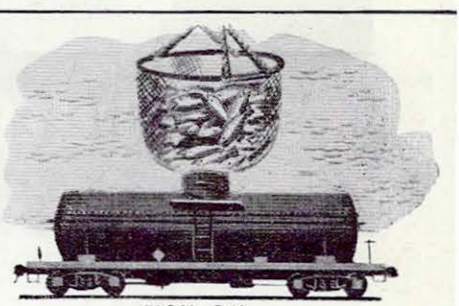
TUNG OIL

Steam coiled steel car, usually of 8,000 gallon capacity.



SULPHURIC ACID

Heavily constructed steel car with heavy truck capacity. Equipped to unload through dome.



FISH OIL

Steel car with steam coils.

Edgewater
EDGEWATER STEEL COMPANY • PITTSBURGH, PA.

ROLLED STEEL WHEELS

Meet all requirements

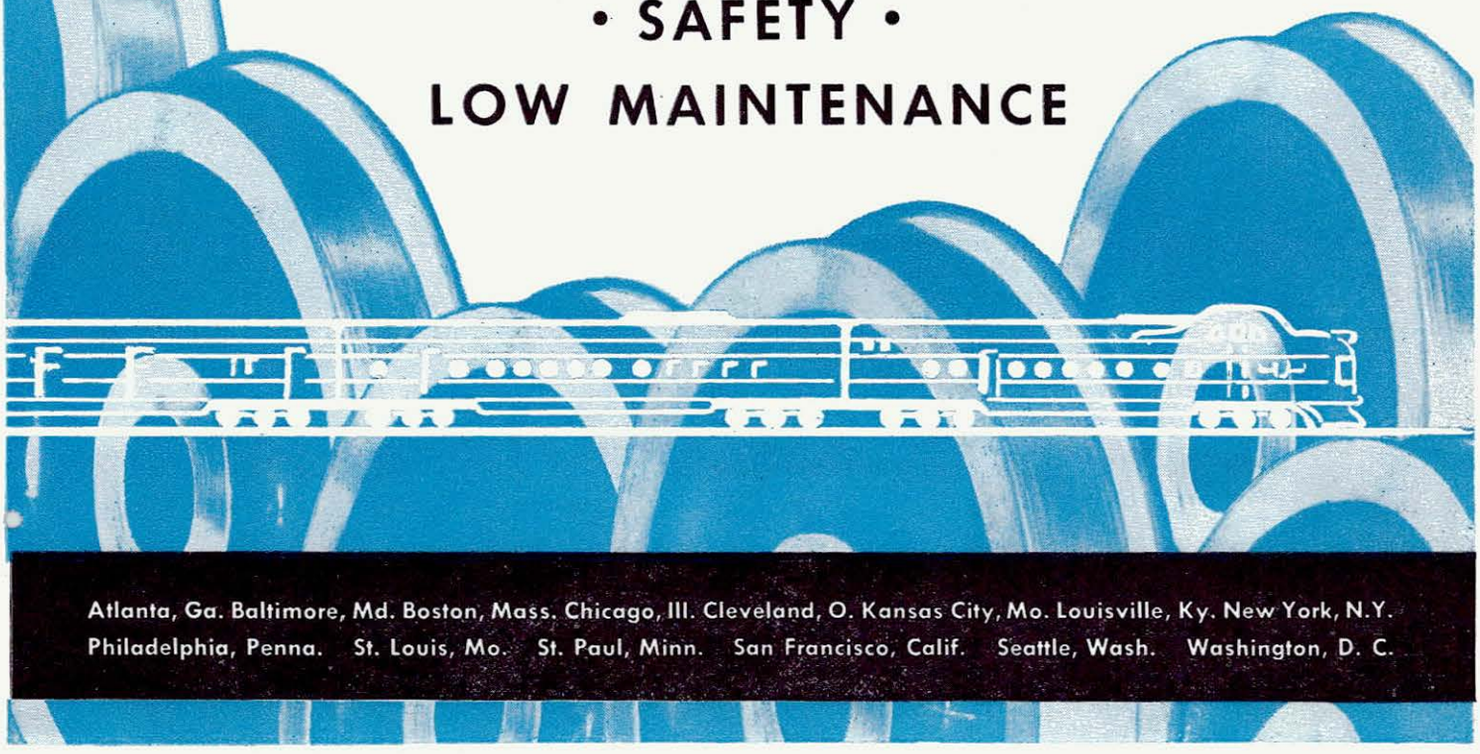
WHILE designers of new and finer passenger cars strive for more speed and greater comfort, they cannot forget safety and low maintenance. So their first consideration is wheels, for upon wheels depends the attainment of all these four basic requirements.

The vigilantly controlled quality of Edgewater Rolled Steel Wheels begins at the open hearth furnace and progresses through each stage to final completion. The results are exceptional toughness and optimum grain structure which mean extra life and added safety.

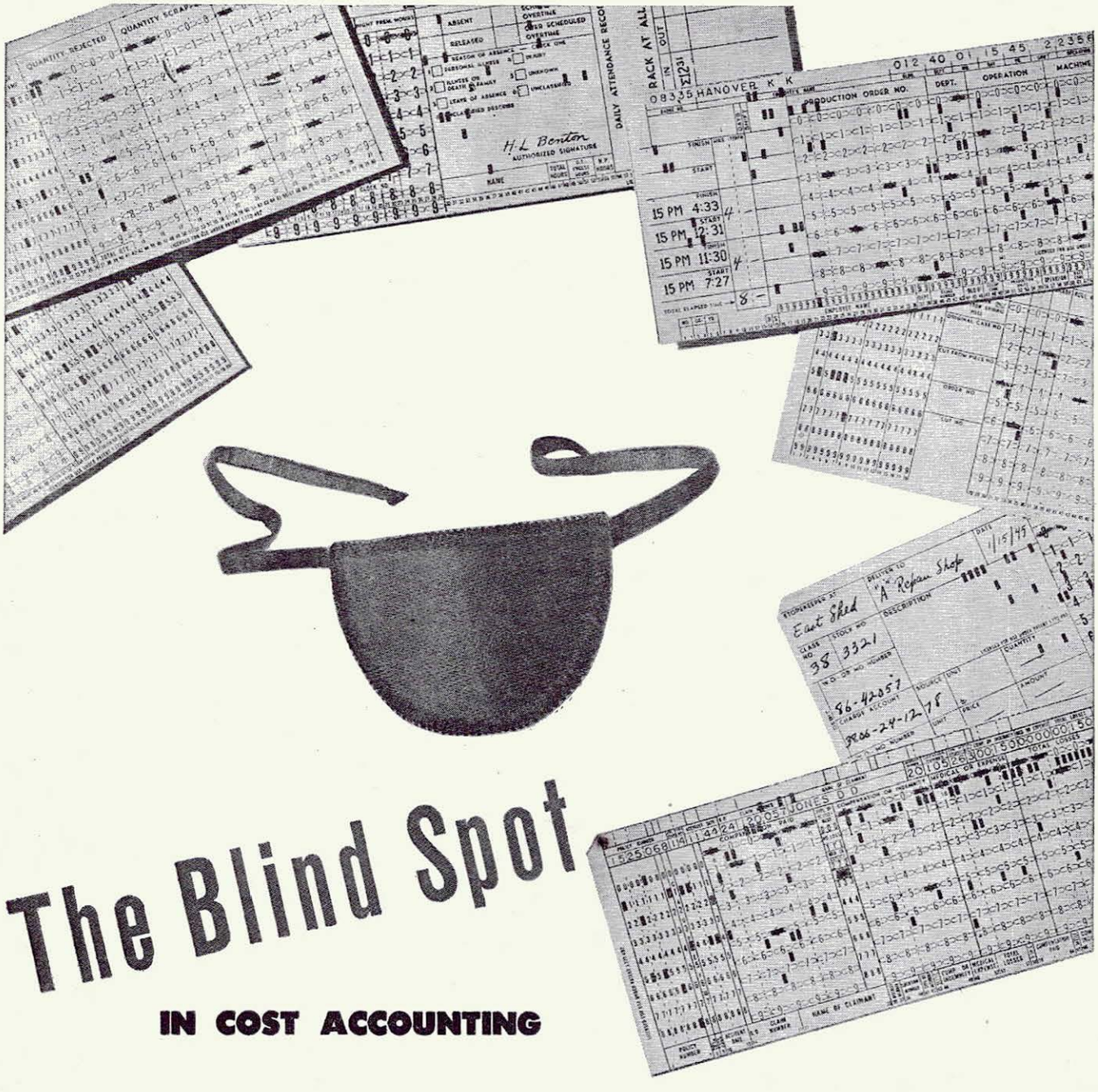
• SPEED • COMFORT •

• SAFETY •

LOW MAINTENANCE



Atlanta, Ga. Baltimore, Md. Boston, Mass. Chicago, Ill. Cleveland, O. Kansas City, Mo. Louisville, Ky. New York, N.Y.
Philadelphia, Penna. St. Louis, Mo. St. Paul, Minn. San Francisco, Calif. Seattle, Wash. Washington, D. C.



The Blind Spot

IN COST ACCOUNTING

Usually when accident costs are figured, many factors involving loss to the employer are not included in compensation and medical expense. Such additional costs as machinery damage, product spoilage and lowered worker morale, to name but a few, *are not insurable,* and are usually buried in the operating overhead.

According to a recognized authority, these "hidden costs" are estimated to be *four times* the amount of the direct costs.

Why not let your nearest A-O Safety Representative show you how much an adequate eye-protection program can save for you.

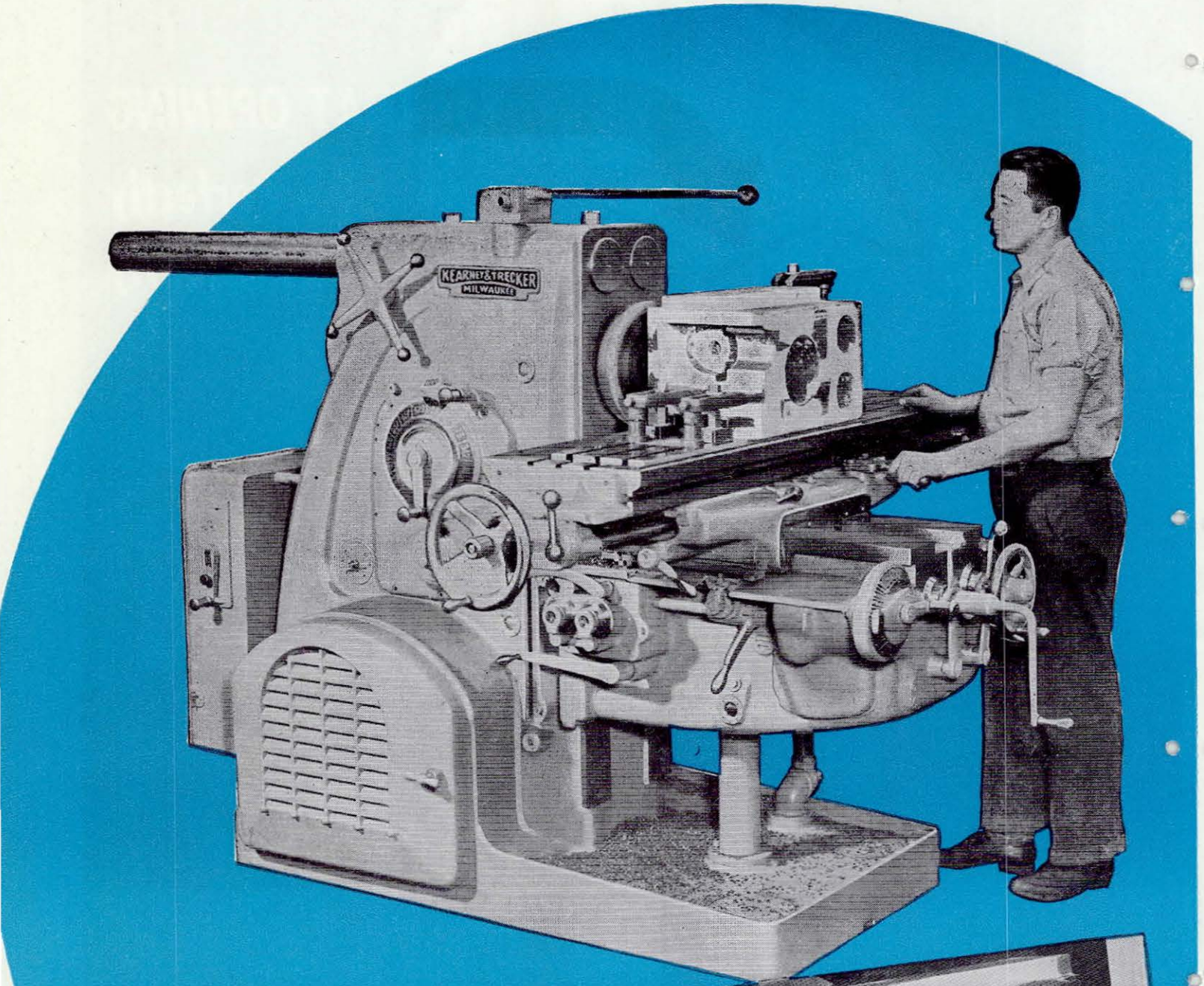
American Optical COMPANY *Safety Division*

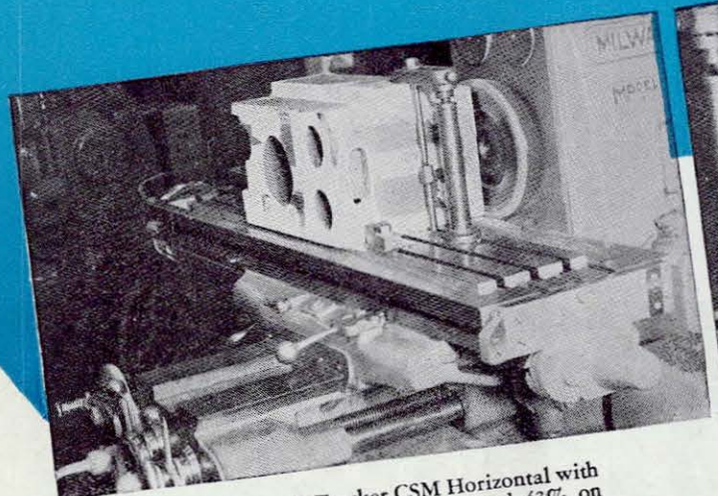
SOUTHBRIDGE, MASSACHUSETTS

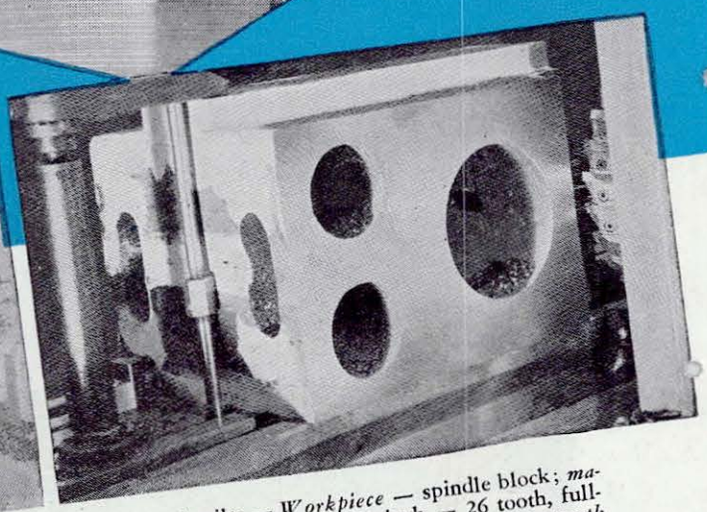
BRANCHES IN PRINCIPAL CITIES

SEAL THAT OPENING
- Perfectly
- Permanently
Here's the ONE weather stripping that won't flatten out with use — and the secret is simple: The rustless spring wire imbedded in resilient sponge rubber. It's totally unlike any other weather stripping you may have used in the past. It's available in a wide variety of sizes and colors for every weather proofing need. Send for a sample and you'll see what we mean. No obligation, of course.
Inner seal
WEATHER STRIPPING
BRIDGEPORT FABRICS, INC.
Established 1837
BRIDGEPORT 1 CONNECTICUT

The Most Powerful Milling







Using a 30 hp Kearney & Trecker CSM Horizontal with carbide cutters, total production time reduced 43% on this face milling operation.

Production details: — *Workpiece* — spindle block; *material* — cast iron; *cutter* — 12 inch — 26 tooth, full-back face mill; *surface speed*—295 sfm; *feed per tooth* — .014 inch; *depth of cut* — 3/16 inch to 1/4 inch.

Machines of Their Type!

20-30-50 hp

Kearney & Trecker CSM's

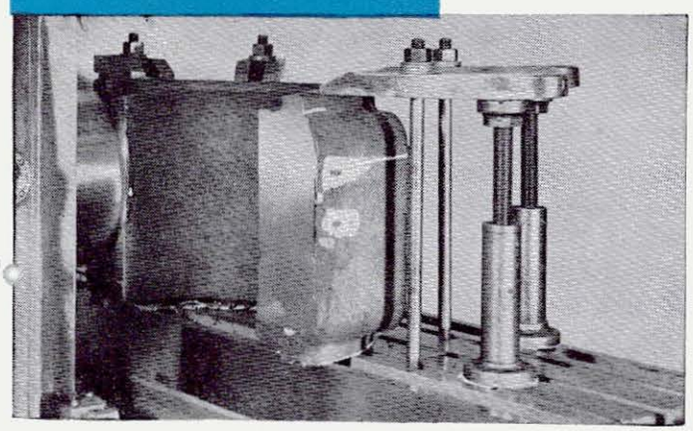
★ You get new high rates of metal removal—ferrous and non-ferrous — without sacrifice of precision.

★ —you get closer tolerances—finer finishes—precision performance — through smooth flow of power to the cutter.

★ —expressly designed for carbide milling of steel but adapted to all-purpose milling, as well.

★ —broad range of application — wide range of speeds and feeds.

★ —exceptional ease of operation — centralized conveniently located controls.



Machine Time Reduced 87%:—surface finishes improved when this operation was performed on a 20 hp CSM Horizontal using carbide milling cutters! *Workpiece* — bearing shell; *material* — cast steel; *cutter* — 10 inch, 12 tooth CSM face mill; *surface speed* — 460 sfm; *feed per tooth* — .010 inch; *depth of cut* — 3/16 inch to 1/4 inch.

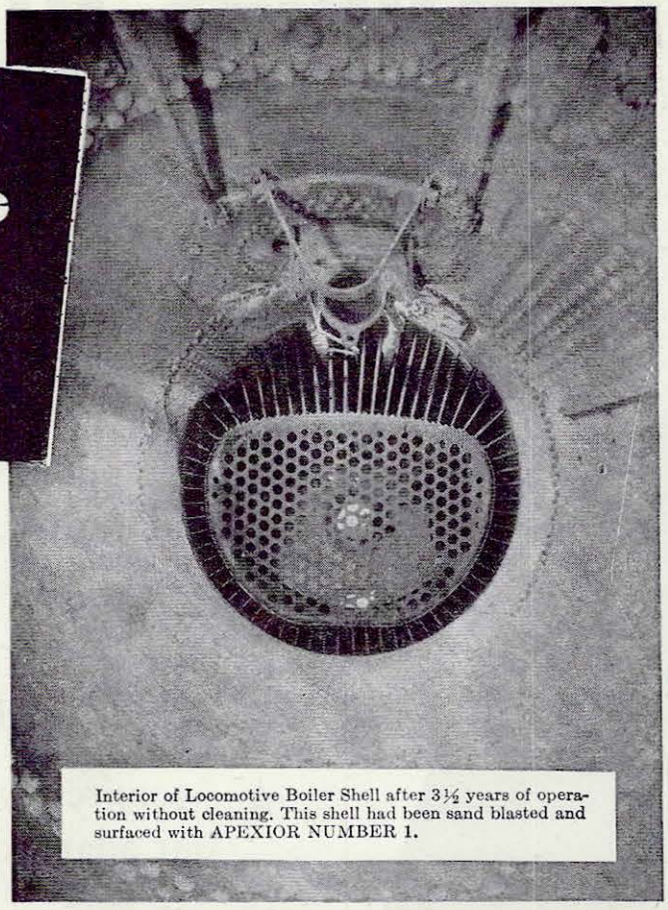
Engineered—from the ground up—for every milling need of today and tomorrow — investigate Kearney & Trecker CSM's; write for Catalog No. CSM-20.

Kearney & Trecker
CORPORATION
MILWAUKEE 14, WISCONSIN

"Be Ready for Tomorrow—with CSM's!"

APEXIOR SURFACING INCREASES OPERATING PROFITS TWO WAYS

1. Lengthens Life of Boiler Metal
2. Shortens Locomotive Shop Time



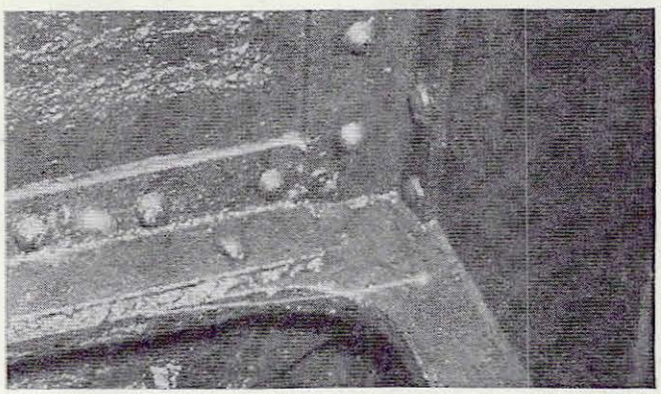
Interior of Locomotive Boiler Shell after 3½ years of operation without cleaning. This shell had been sand blasted and surfaced with APEXIOR NUMBER 1.

That the use or non-use of APEXIOR can make a noticeable difference in your profit sheet may appear to be overemphasis of a maintenance detail. But figure it out for yourself.

A brush-applied protective coating of APEXIOR NUMBER 1, a few thousandths of an inch thick, prevents water or steam from contacting the metal of locomotive boiler shells and other surfaces exposed to boiler water and steam. That's why it effectively retards or checks corrosion and pitting in boilers . . . minimizes the hazards of embrittlement or accelerated stress corrosion. Naturally, that lengthens boiler life . . . postpones indefinitely investment in costly replacement parts.

Moreover, APEXIOR NUMBER 1 retards formation of scale . . . prevents adherent bonding with the metal. Whatever scale does adhere comes off easily. And because an APEXIORIZED surface remains smooth, boiler deposits have little to cling to . . . so, flush away easily . . . Boiler washing is more effective. That means that locomotives spend less time in the shop . . . more time carrying payloads.

APEXIOR NUMBER 1 is applied in thousands of locomotive boilers subject to Interstate Commerce Commission inspection.



APEXIOR NUMBER 3

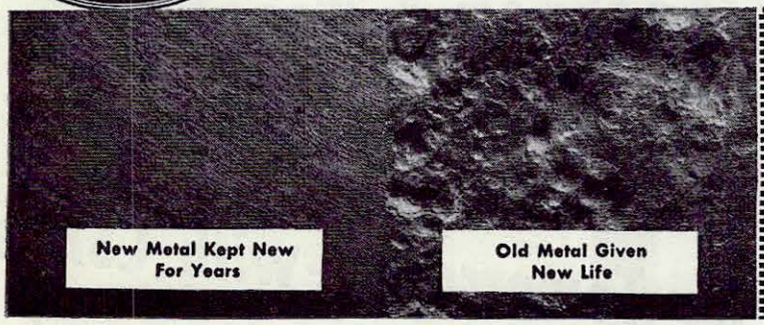
See how this brush-applied, durable coating protects the water space of locomotive tenders. It air-dries to a chemically inert, shiny-black film, resistant to water, moisture and chemicals used in water-conditioning. It does not affect potability of water. Picture shows interior of tender cistern 21 months after surface at right was coated with APEXIOR NUMBER 3. Corroded surface at left was not coated, for comparative test.

See *Locomotive Cyclopedia*. And write for Bulletin.

APEXIOR REG. U.S. PAT. OFF.

Keeps new metal new . . . Gives old metal new life

DAMPNEY



THE DAMPNEY COMPANY OF AMERICA
Hyde Park, Boston 36, Mass.

Please send free Bulletin.

Name.....

Company.....

Address.....

.....

FLUORESCENT?
Sure I want G-E's
new 4500 white!
GENERAL ELECTRIC
And now it's available in all the G-E Fluorescent lamp sizes.
You will find that General Electric 4500 white means more than just the name for a new color!
Coming between 3500 white and 6500 daylight, it brings better color discrimination, warmth—makes things look more natural for most people!
Added to the regular white and daylight fluorescent lamps, G-E 4500 white answers a growing demand for a fluorescent light with wider usefulness, eye comfort. Here's another product of G-E lamp research, always aimed at making G-E lamps Stay Brighter Longer!
Stay Brighter Longer!
G-E LAMPS
GENERAL ELECTRIC

FEATURES OF THE ALCO SUPER DIESEL ENGINE

STURDY—Cylinder block, base, and generator adapter are of welded construction; engine is light, yet has great strength and rigidity.

COOL—Turbosupercharging and 4-cycle design insure cool, reliable operation.

SIMPLE—Design is simple and rugged—the one 12-cylinder engine requires fewer ports and valves than any comparable-rated diesel.

ACCESSIBLE—V-design makes all major parts easily accessible. In addition, cylinder heads are independent and can be removed individually. Fuel injection equipment can be reached from outside the engine. Main and connecting rod bearings can be renewed without removing any parts other than their own caps.

Built TO INCREASE RAILROAD EARNING POWER

THE NEW ALCO-G-E "1500"

Less Time In the Shop...
More time in Service

Built to increase railroad earning power, the new Alco-G.E. diesel-electric is powered by a *single 12-cylinder*, V-type, turbosupercharged Alco engine, designed specifically for railroad service.

It is built to operate 1,000,000 miles before major overhaul. Many months of scheduled road service on three of the country's largest systems have proven the complete reliability of this super diesel engine.

Use of this one reliable power plant increases availability for service because it greatly simplifies all maintenance operations and reduces out-of-service time to a minimum. Routine inspection and servicing is easier and faster. You have only one 12-cylinder power plant to take care of.

When minor repairs and replacements must be made, the work can be done speedily during layovers at terminals with no loss of time on the road. Fewer renewal parts are needed, and unequalled accessibility of all engine parts keeps time and costs down. And, with this compact engine, there's plenty of working room in the cab.

When major overhaul finally does become necessary, you don't have to tie up your whole locomotive for days at a time. Simply open the hatch, lift out the engine, and replace it with a standby power plant. Then get your locomotive out of the shop and back where it belongs—on the road in revenue service. Overhaul of the 12-cylinder engine can be finished in less time because there are fewer parts to remove, repair, or replace.

The Alco diesel engine is only one of the many new features of the "1500." The constant-pressure turbosupercharger, the specially developed, railroad-type generator and traction motors, the power plant load regulator, the thermostatic engine cooling system—all combine to make a locomotive that will haul more ton-miles at lower cost. This diesel-electric is *really built to increase railroad earning power.*

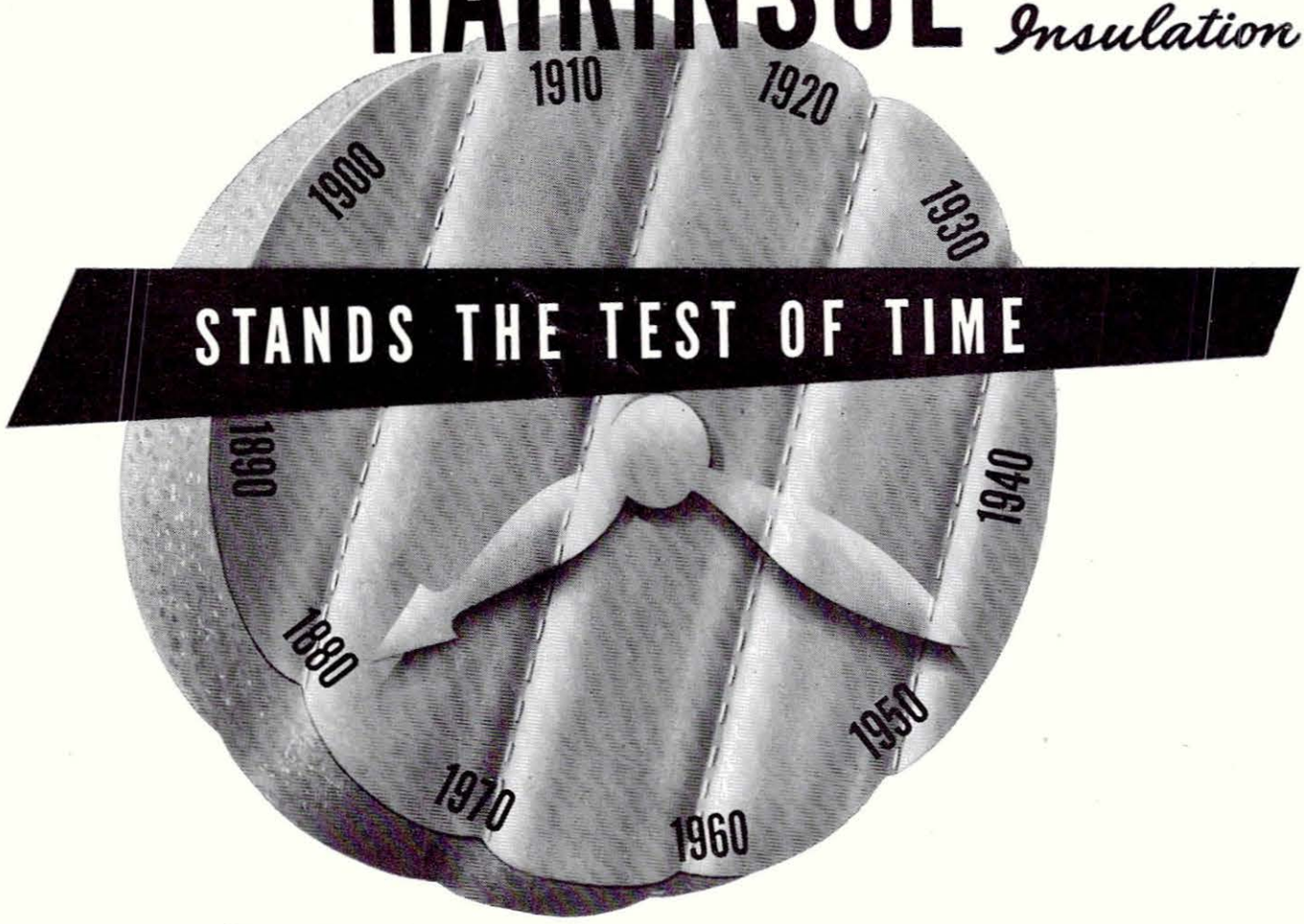
Alco GE

AMERICAN LOCOMOTIVE AND GENERAL ELECTRIC

113-168-9580

Permanent

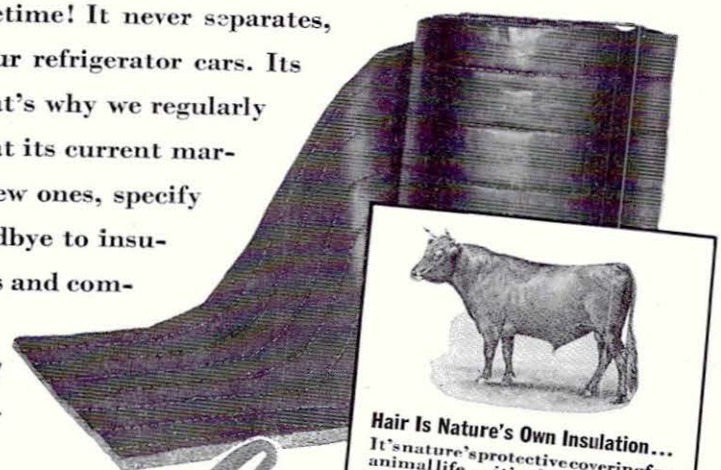
HAIRINSUL *Insulation*



IN REFRIGERATOR CARS

HAIRINSUL lasts a lifetime! It never separates, settles or develops ice-wasting spaces in your refrigerator cars. Its high insulating efficiency is permanent. That's why we regularly buy back hair reclaimed from HAIRINSUL at its current market value. When you rebuild cars or order new ones, specify *all-hair* HAIRINSUL insulation and say goodbye to insulation worries *forever*. Send today for samples and complete engineering data.

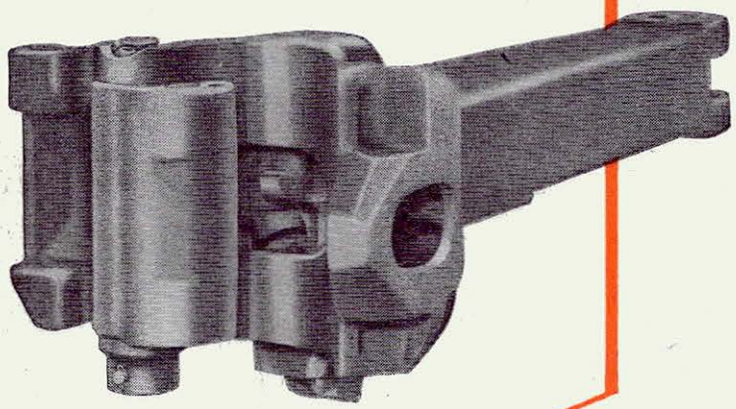
AMERICAN HAIR & FELT COMPANY
Dept. 6C-8, Merchandise Mart, Chicago 54, Ill.



Hair Is Nature's Own Insulation...
It's nature's protective covering for animal life... it's a barrier against extreme outside temperature changes. HAIRINSUL is made of animal hair... one of the best reasons why HAIRINSUL is accepted as the finest of all insulating materials for refrigerator cars.

Hairinsul

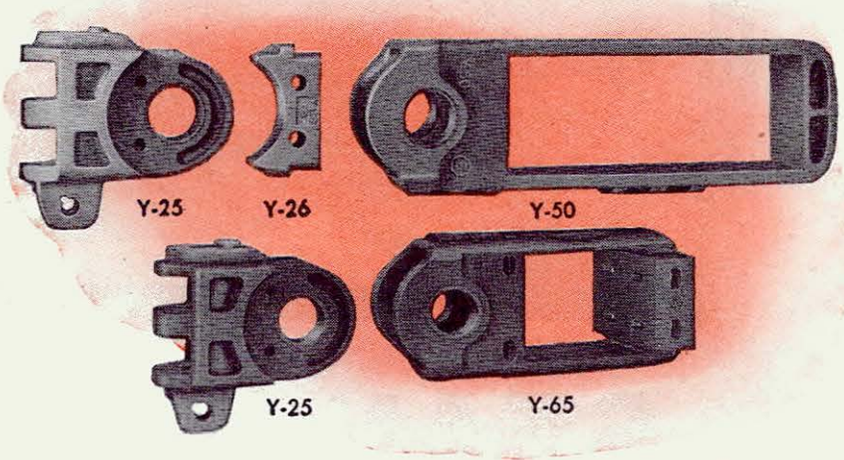
ALL HAIR INSULATION FOR REFRIGERATOR CARS



The A.A.R. STANDARD TYPE H
TIGHTLOCK COUPLER
and Attachments

Provide Maximum Comfort and Safety

- No slack in coupler contour.
- Noise caused by coupler slack eliminated.
- Coupler interlock provides maximum safety.
- Improved lock anti-creep protection.
- Wear and Maintenance reduced to a minimum.
- Meet A.A.R. Passenger Car Specifications for strength.



B

THE BUCKEYE STEEL CASTINGS COMPANY

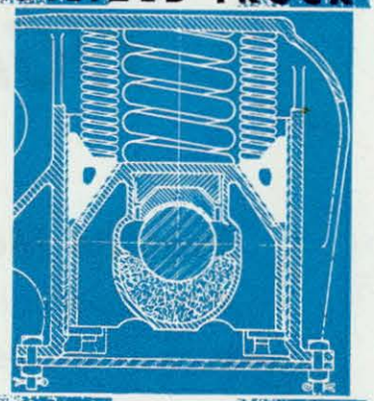
New York, N. Y. Columbus, Ohio Chicago, Ill.

ANNOUNCING

THE NEW TYPE S-5-L BARBER STABILIZED TRUCK FOR HIGH SPEED SERVICE

The engineering features of this new style truck that make its performance outstanding in high speed passenger train interchange service include:

. . . all stabilized parts applied directly over oil box to control vertical shocks the instant wheels contact rail joints . . . special contour design of the drop forged roller caps and roller seats provides action similar to 16" swing hangers . . . all springs have a travel of 3 13/16".



FOR SATISFACTORY RESULTS AT HIGH SPEEDS, REMEMBER

BARBER STABILIZED S-5-L TRUCKS

STANDARD CAR

332 S. MICHIGAN AVENUE

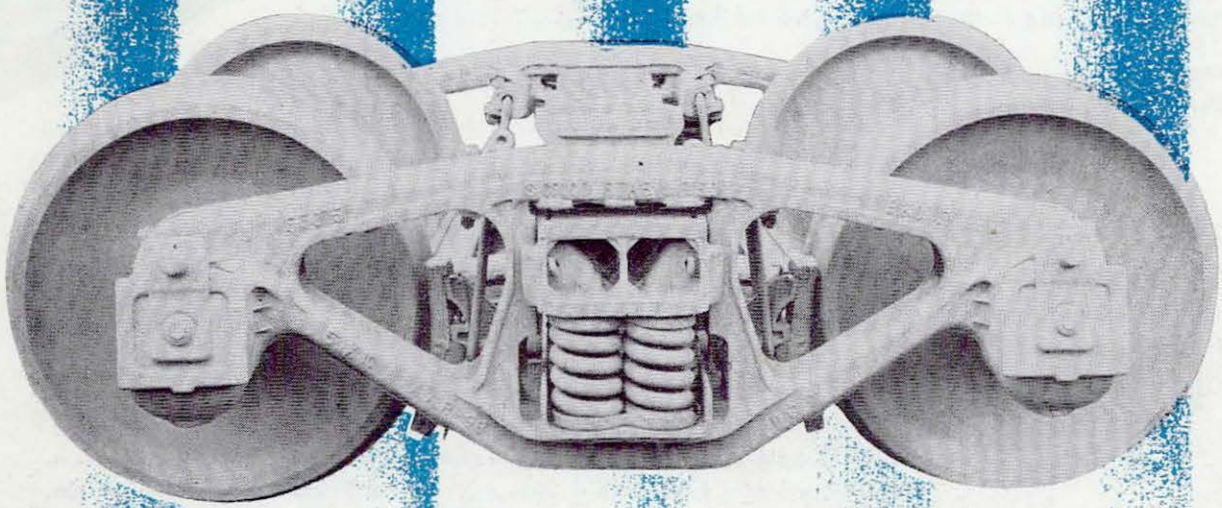
OVER 110,000 CAR SETS

UNDER ALL TYPES OF FREIGHT CARS . . .

Efficient performance day in and day out is one of the primary reasons for over 110,000 car sets of Barber STABILIZED Trucks on 58 different railroads and private car lines.

This performance is the result of the smooth, easy ride that Barber STABILIZED Trucks provide. With the stabilizing action of these trucks in proportion to the car load — NOT A FIXED PRESSURE — harmonic bounce, spring breakage and bolster and column wear are eliminated. Since no looseness can develop between the bolster and side frame columns, Barber STABILIZED Trucks are operating safely at high speeds.
To be certain of your freight car service, specify

BARBER *STABILIZED* TRUCKS

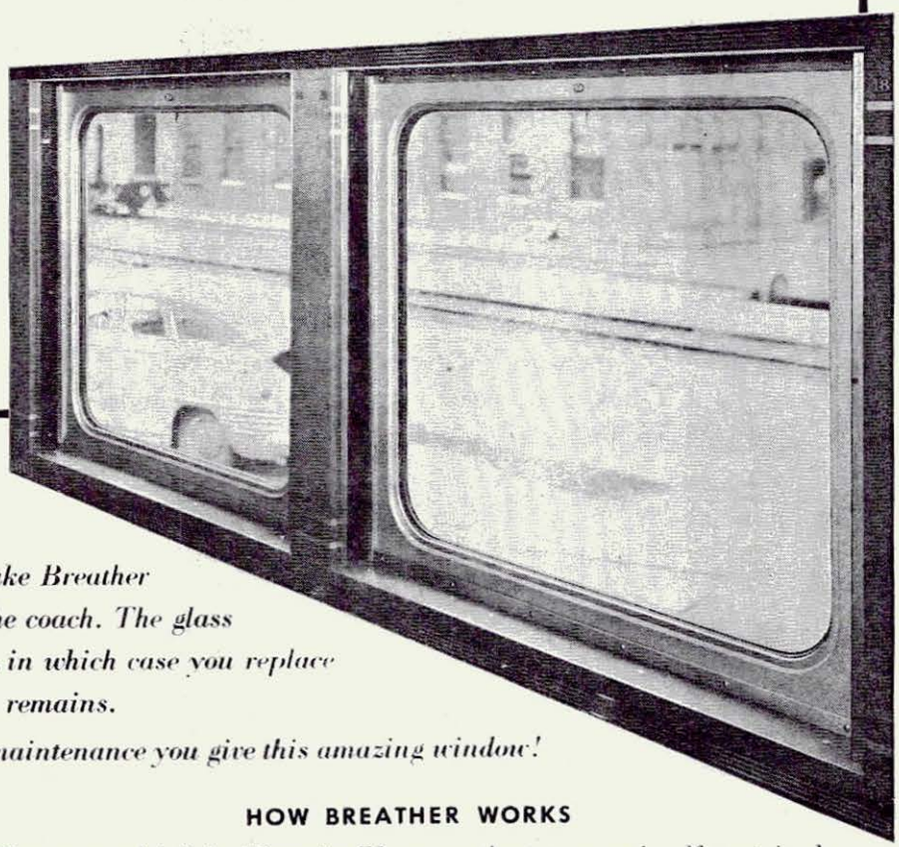


TRUCK COMPANY

CHICAGO 4, ILLINOIS

With an Adlake Breather Window

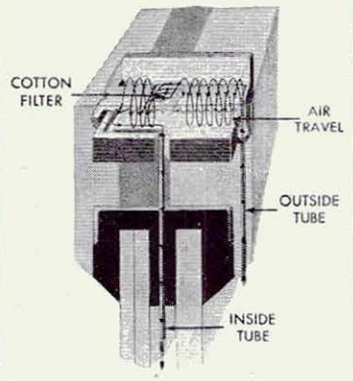
You Don't Throw Away the Unit When the Glass Breaks!



Yes . . . when you install the Adlake Breather Window, it's there for the life of the coach. The glass will not break except by impact . . . in which case you replace the glass only—the rest of the unit remains.

So routine washing is the only maintenance you give this amazing window!

ADLAKE BREATHER UNIT



HOW BREATHER WORKS

The patented Adlake "Breather" between the two panes is self-contained . . . *requires no maintenance.* As outside air enters the "breather" tube it is cleansed of dust and dirt, adjusts itself to altitude and temperature changes.

Thus the enclosed pane surfaces are *always* clear and clean—*will never cloud, steam, or frost.* Both panes are sealed in rubber . . . the sash is durable, smart-looking aluminum or Alumilite* finished.

LET THEM *SEE* THE SCENERY YOU ADVERTISE

We believe you'll be surprised when you learn how easily and economically Adlake Breather Windows can be installed in either new or reconditioned cars. Complete details are yours on request—at no obligation. Why not write us today?

*Patented Process of Aluminum Company of America

Adlake TRADE MARK

THE ADAMS & WESTLAKE COMPANY

ESTABLISHED IN 1857 — ELKHART, INDIANA — NEW YORK · CHICAGO

Manufacturers of Adlake Specialties and Equipment for Highway, Airway, Railway, and Waterway

MAGOR

Designers and Manufacturers of Freight Cars of All Types Including Air Dump Cars...

MAGOR CAR CORPORATION

50 Church Street

New York 7, N. Y.

80% OF NEW CAR

RAILWAY OUTLOOK

A WEEKLY NEWS LETTER PUBLISHED EXCLUSIVELY FOR ADVERTISERS IN THE SIMMONS-BOARDMAN RAILWAY PAPERS

Letter No. 7 (1946 Series) February 13, 1946

CAR LOADINGS: Loadings of revenue freight for the week ended February 2 amounted to 723,135 cars. This was 14,305 cars, or 2.0 per cent, more than for the preceding week; 16,421 cars, or 2.2 per cent, fewer than for the corresponding week last year; and 82,579 cars, or 10.2 per cent, fewer than during the corresponding week two years ago.

Below is a breakdown of loadings of revenue freight for the February 2 week and the first five weeks:

	1946	1945	Change	Per Cent
l.c.l.	118,641	93,896	+24,745	+ 26.4
Full Carload	604,494	645,660	-41,166	- 6.4
Feb. 2 Week (Total)	723,135	739,556	-16,421	- 2.2
5 Weeks l.c.l.	566,644	516,694	+49,950	+ 9.7
5 Weeks (Total Cars)	3,606,755	3,743,211	-136,456	- 3.6

MATERIALS AND PRICES: Under this heading the February 9 RAILWAY AGE published on pages 339 and 340, a digest of orders and notices of interest to the railroads issued by the Civilian Production Administration and the Office of Price Administration since January 29. The references include: C.P.A.'s Monthly Report; Steel Inventory. References under Prices include: Bunker Fuel; Hardwood Flooring; Imitation Reed; Iron and Steel Scrap; Softwood Shingles.

1945 EXPORT FREIGHT MOVEMENT: Due to "heavy relief programs," exports of freight from East Coast ports, including coal and grain, are continuing at approximately wartime levels, according to the Office of Defense Transportation. During the past two months more ships were loaded at East Coast ports than during the corresponding period a year ago--1,438 as compared with 1,307. The total number of cars unloaded for export at all ports, including grain but excluding coal, was 1,887,829 for the year 1945. This is very close to the record 1944 figure of 1,913,421 cars, in spite of the drop in war shipments following V-E Day and V-J Day.

G.M.& O. TRAIN TIME CUT BY NEW DIESEL LOCOMOTIVES: The running time of the Gulf, Mobile & Ohio's streamliner train, the "Rebel" operating between St. Louis, Mo., and Mobile, Ala., has been cut one hour as the result of the acquisition of two new 4,000-hp. diesel-electric locomotives. Effective March 16, the southbound Rebel will make the run in 16 hours, while on the northbound run a full hour will be saved.

(Continued on Reverse Side)

SIMMONS-BOARDMAN PUBLISHING CORPORATION • 30 CHURCH STREET • NEW YORK 7, N. Y.
105 West Adams Street, Chicago 3 Terminal Tower, Cleveland 13 1081 National Press Building, Washington 4, D. C.
1038 Henry Building, Seattle 1, Wash. 300 Montgomery Street, San Francisco 4, Cal. 530 W. 6th Street, Los Angeles 14, Cal.
Railway Signaling

CONTRACTS SPECIFY Plymetl

Of the 2,183 passenger cars on order for 1946, Plymetl partitions, bulkheads or doors will be in 80% of these cars. A few of the reasons for this swing to Plymetl are outlined below.

PLYMETL ELIMINATES DEADWEIGHT

The weight of aluminum faced Plymetl is 1.8 lbs. per sq. ft. The corresponding weight for hollow aluminum is 2.2 lbs. per sq. ft. and for hollow steel, 4.8 lbs. per sq. ft. It is readily apparent that Plymetl can save up to 3 lbs. for each sq. ft. of partition.

IS SOUND DEADENING

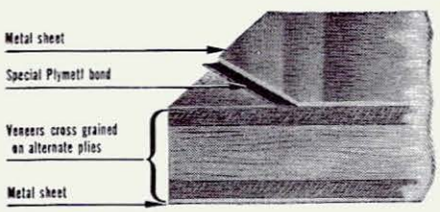
Plymetl partitions are sound deadening . . . they lessen vibration and wheel noises. This greatly increases passenger comfort and provides a more luxurious ride.

IS EASILY FABRICATED

Plymetl is easily and quickly fabricated with simple machinery or hand tools. Special equipment has been developed, but ordinary shop woodworking and metalworking equipment may be used.

PRESENTS A CLEANER, BETTER APPEARANCE

Smooth and flat, Plymetl takes a beautiful finish. It requires no welding in the face of partitions thus eliminating glazing of welds which may fail or loosen. Plymetl will not buckle or dent. It lends itself excellently to modern design and fine finishes.



PLYMETL CONSTRUCTION

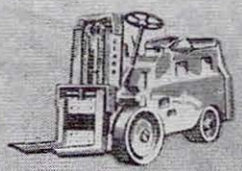
Light gauge metals are bonded to one or both sides of plywood panels to produce structural materials having unusual properties. Its construction effects the most efficient distribution of these materials, combining high strength qualities of the metal surfaces with the rigidity of plywood.

The new "Plan With Plymetl" catalog contains complete information on use, fabrication, fastening and finishing of Plymetl. This Plymetl book of knowledge can be your guide to greater profits. Write for your free copy today.

HASKELITE

MANUFACTURING CORPORATION Dept. RR-9, Grand Rapids 2, Mich.

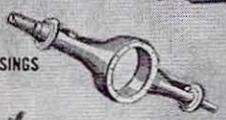
NEW YORK CHICAGO DETROIT CLEVELAND ST. LOUIS PHILADELPHIA CANADA: RAILWAY & POWER ENGINEERING CORP., LTD.


INDUSTRIAL TRUCKS AND TRACTORS

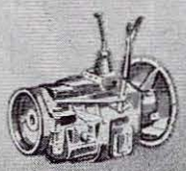
DRILLS AND REAMERS

METAL SPOKE WHEELS

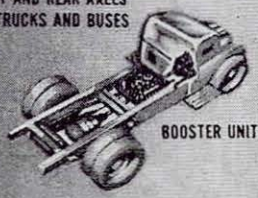
BLIND RIVETING PROCESS


AXLE HOUSINGS

HOW TO QUIT BOTHERING *about Tools*

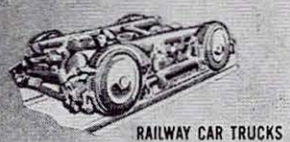

TRANSMISSIONS

FRONT AND REAR AXLES FOR TRUCKS AND BUSES

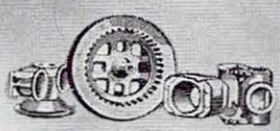

BOOSTER UNITS

GEARS AND FORGINGS

ANY drill, reamer or cutting tool "looks good" when conditions are ideal. The real test is—how does it look, *and behave,* when conditions are far from ideal? Celfor Tools look good in the tough, dreary routine of day-after-day work. They stand up—keep their cutting qualities—deliver the honest, reliable, workmanlike performance you expect of them.


RAILWAY CAR TRUCKS

EASY ROLL TRAILER AXLE


ELECTRIC STEEL CASTINGS

It's a complete line: Celfor high speed Twist Drills, forged to shape and twisted hot—for tougher, denser metal; Celfor Reamers, a standard of good performance for more than 40 years; and Celfor Carbide Cutting Tools, of the unsurpassed excellence you associate with Celfor.

CELFOR TOOLS

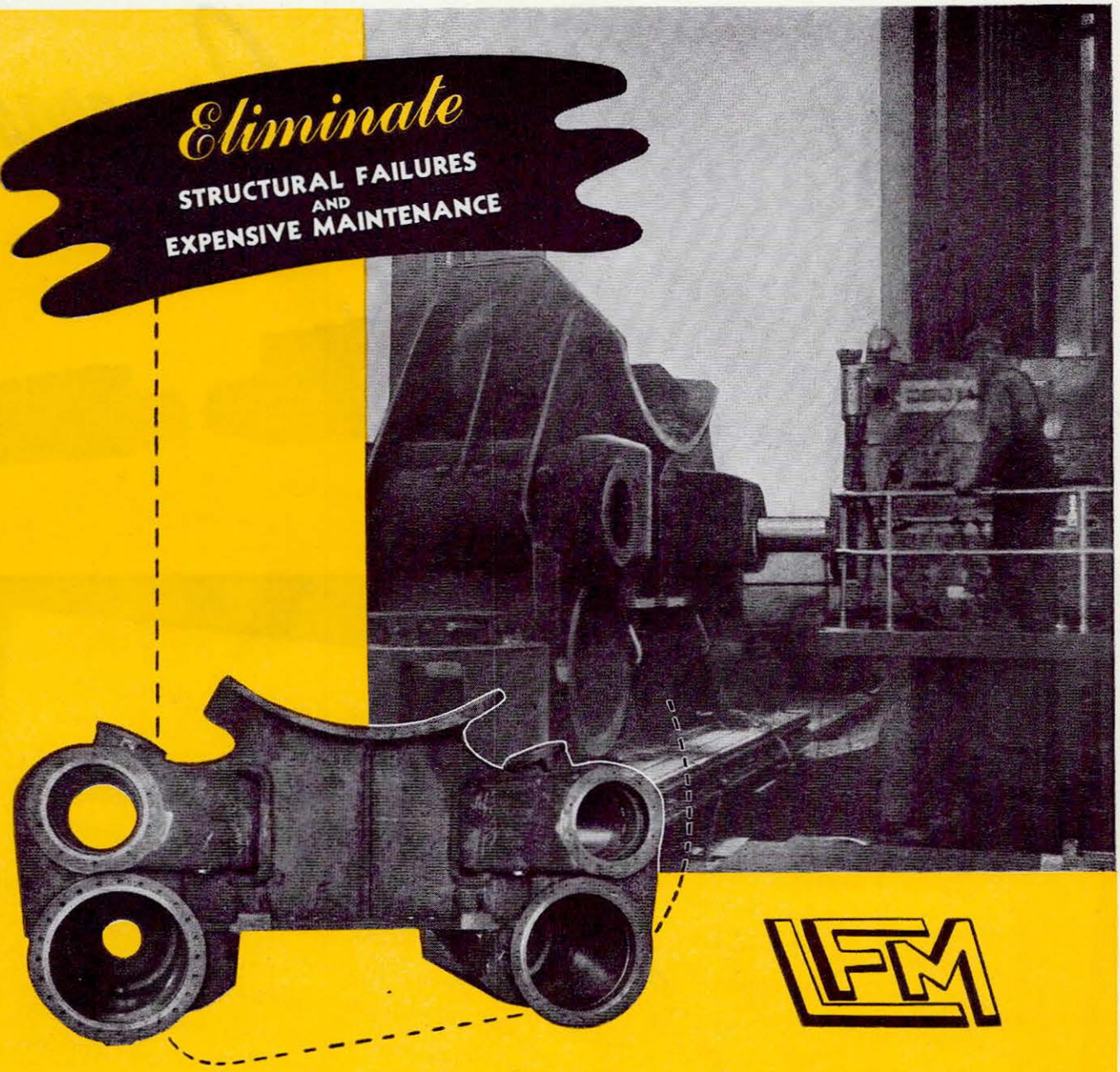
Division of CLARK EQUIPMENT COMPANY

BUCHANAN, MICHIGAN

OTHER PLANTS – BATTLE CREEK, JACKSON, BERRIEN SPRINGS, MICHIGAN

Eliminate

STRUCTURAL FAILURES AND EXPENSIVE MAINTENANCE



LFM

LFM Cast Steel and Gray Iron Cylinder Castings—either one-piece or two-piece—are the products of high quality workmanship, experienced engineering, and metallurgical skill combined to insure reliable performance.

Our one-piece cylinder saddles are designed to effect a substantial front brace, integral back cylinder heads and independent passages, and a reduction in bolted connections—features which minimize maintenance and obviate structural failures.

Modernize your locomotives with these precision-machined castings, and derive measurable benefits in operation.

ESTABLISHED 1872

Pioneers in the Development of the Light Weight Piston and Combination Sectional Packing.

CONSULT OUR ENGINEERS

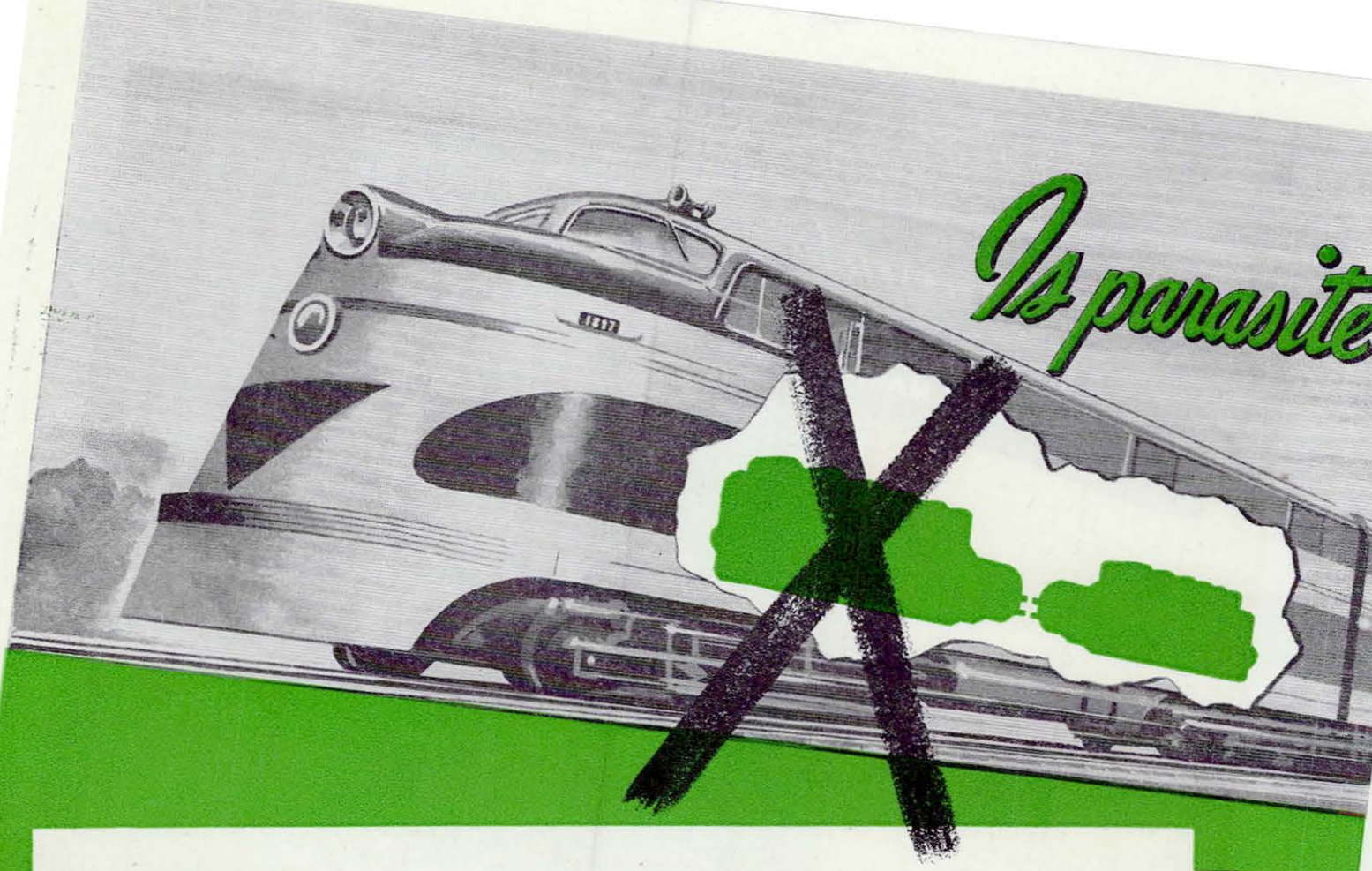
Their experience and our modern shop facilities are always at your service.

MAKERS OF

Light Weight Alloy Steel Pistons and Universal Sectional Bull Packing Rings, and Universal Wheel Centers.

THE LOCOMOTIVE FINISHED MATERIAL CO.

ATCHISON, KANSAS ★ NEW YORK CITY ★ CHICAGO, ILL.



Its parasite

SCRATCHED — one power plant . . . all the power of one of the six that should be hauling payload.

That's what happens when axle-driven generators and air conditioning systems impose their parasite load upon the locomotive. Power that should be producing revenue is lost.

. Stop this loss. Put the power parasites off the train. Get *all* the locomotive's power. Pull more cars . . . and please more passengers, with the complete comfort of Waukesha modern, deluxe air conditioning and illumination. Supplied *on demand* . . . . automatically . . . *to every car* by Waukesha engine-driven units.

Completely independent of car location or movement . . . terminal standby service . . . or the locomotive itself!

Full output is available *anywhere* and *at any time*—day or night, winter or summer.

The Waukesha Ice Engine delivers full car-cooling capacity under thermostatic control. Cooling is proportioned to demand by modulation. Wide fluctuations in temperature and humidity are reduced—assuring maximum passenger comfort.

The Waukesha Engine-Generator — a compact, lightweight, dependable power plant—equally automatic and entirely independent—supplies full voltage illumination, to complete the Waukesha comfort cycle.

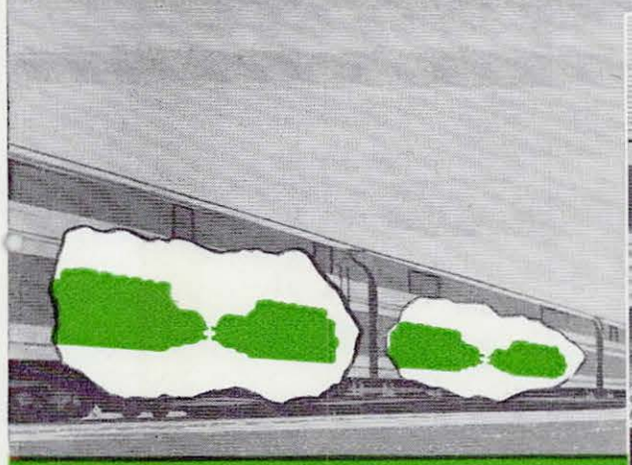
Over ten years of outstanding service, and millions of miles of operation on the cars of more than 30 major American railways, and the Pullman Company—have tested and proved the advantages and savings of these Waukesha units.

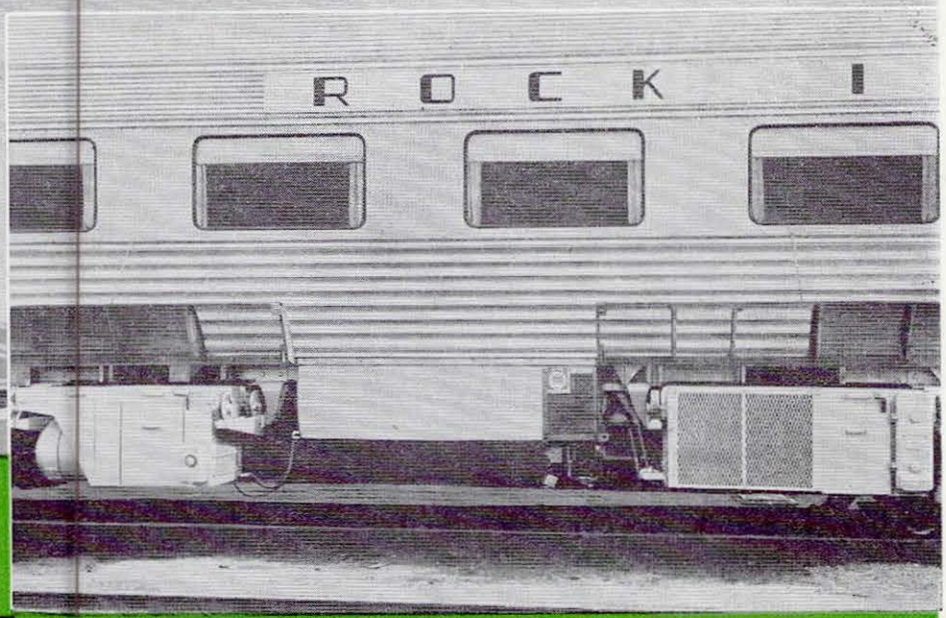
Your new equipment plans should include the Waukesha Comfort Twins. Send for Bulletins 1114 and 1179.

Refrigeration Division, **WAUKESHA MOTOR**

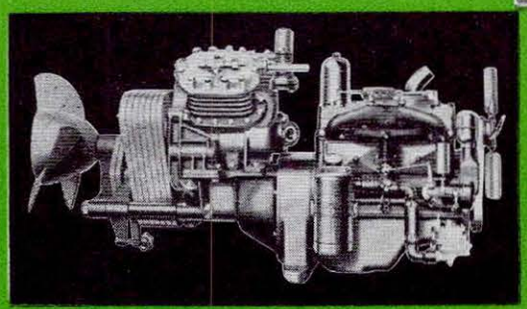
Largest Builders of mobile, engine-driven

load stealing ⅙ of your power?

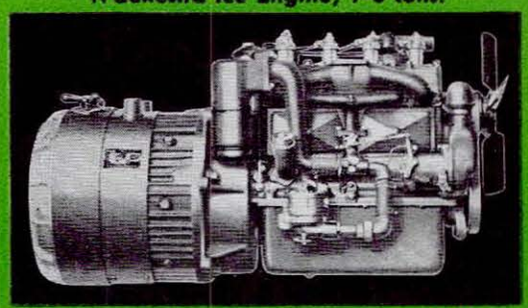




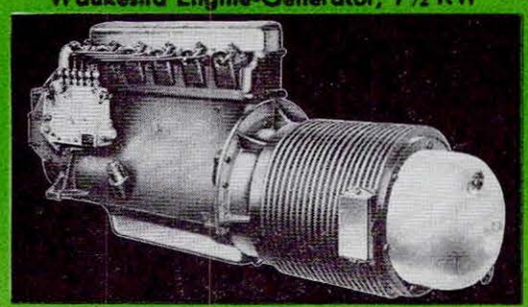
(left to right) Waukesha Engine-Generator, Sub-Cooler, and Ice Engine. The Engine-Generator and Ice Engine are withdrawn for inspection or servicing.



Waukesha Ice Engine, 7-8 tons.



Waukesha Engine-Generator, 7½ KW



Waukesha Engine-Generator, 25 KW

WAUKESHA *Engine Driven* EQUIPMENT

THE WAUKESHA *Comfort* TWINS
. . . Ice Engine and Engine-Generator

COMPANY • WAUKESHA, WISCONSIN

Refrigeration and Generator Equipment

OVER 21,000 SERVICE HOURS—
"WITHOUT SHOP WORK OF ANY CONSEQUENCE"

Week in — week out, for the past four years, this "Caterpillar" Diesel-powered 44-tonner has turned in an amazing record for on-the-job performance.

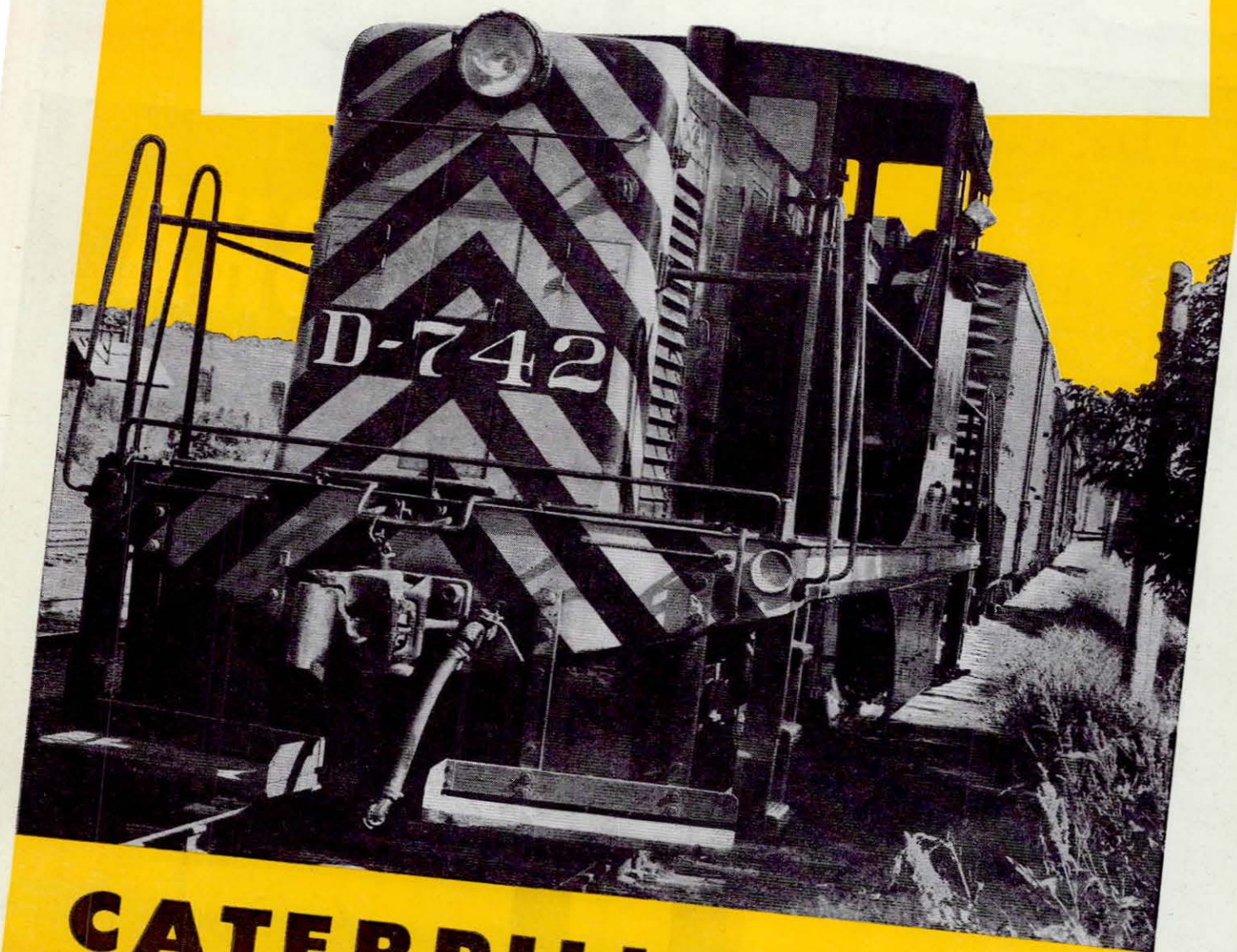
Put into service by The Minneapolis & St. Louis Railway Company in July, 1942, it has handled 70% of the railroad's general switching in the busy Mason City, Iowa, yard ever since that time.

Operating on a basis of two 8-hour shifts a day, six days a week, and one shift on Sunday, "it has not been to the shop for work of any consequence."* Total operating cost, of course, has been far less than that of other types of power.

The same rugged "Caterpillar" Diesel Engines that power this locomotive have gone into 90% of the 44-tonners operating on Western Hemisphere class railroads.

CATERPILLAR TRACTOR CO. • PEORIA, ILL.

**Quoting Mr. R. C. Goebel, Mechanical Superintendent of The Minneapolis & St. Louis Railway Company.*



CATERPILLAR DIESEL ENGINES

REG. U.S. PAT. OFF.

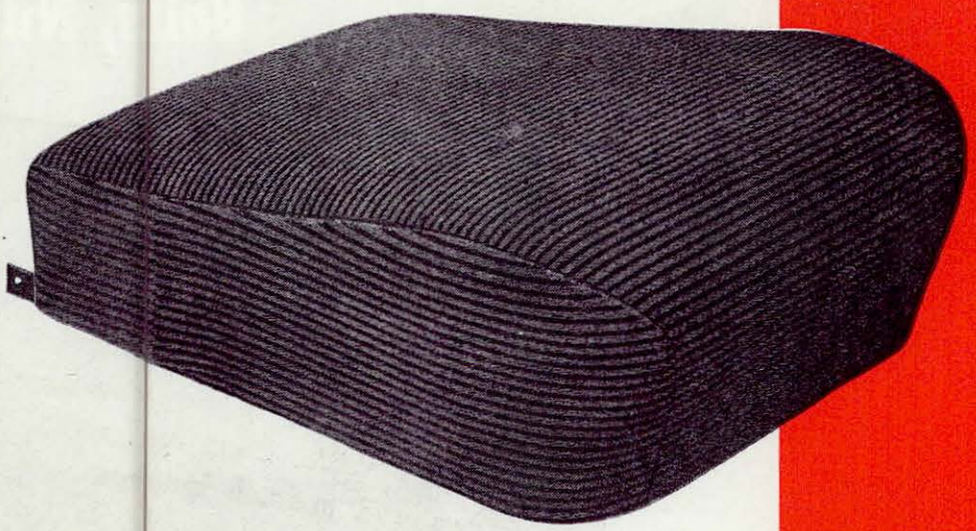
TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

on LAND on SEA and in the AIR

TRAVEL COMFORT* CUSHIONS

Provide Your Passengers with

Resilient Floating Comfort



available in

TRAVEL COMFORT CUSHIONS*

● No method of cushioning can ever surpass the buoyant action of Travel Comfort Cushions. They utilize superior spring constructions with properly selected cushion top-pads of almost any suitable material.

No material, however ideal as padding, is ever completely satisfactory as ***full*** seat cushioning.

The weight of a passenger is impressed upon or into the firm surface or soft pliable area afforded by the padding materials. Such materials do not possess the "spring-back" needed for sustained comfort. Though at first, frequently mistaken for "comfort" such varying support soon tires the body and fatigue is experienced.

On the other hand, the spring construction portion of a TRAVEL COMFORT CUSHION, acts in conjunction with the comfortable top-pad, providing a floating action, which is gently resilient to varying weights or to shock impacts from above or beneath the cushion. Such life-like action produces permanent comfort and effortless riding.

With comfort engineered into the design, using only the finest materials, skillful workmanship and strictest inspection.

TRAVEL COMFORT CUSHIONS ARE

Fully Guaranteed

Investigate these "business building" cushions, which provide your passengers with resilient, floating comfort. Use them on your new or rehabilitated seating.

You can have any type of top-pads you want with TRAVEL COMFORT CUSHIONS: Curled hair, rubberized hair, vegetable fibres, synthetic rubber, natural and synthetic rubber combinations and numerous other filler materials.

*Trade Mark

TRAVEL COMFORT CUSHIONS *Ideal for* Train or Plane, For Bus or Truck, For Transit Cars or Cabs

McINERNEY SPRING AND WIRE COMPANY

Factories: Grand Rapids, Michigan, and Passaic, New Jersey

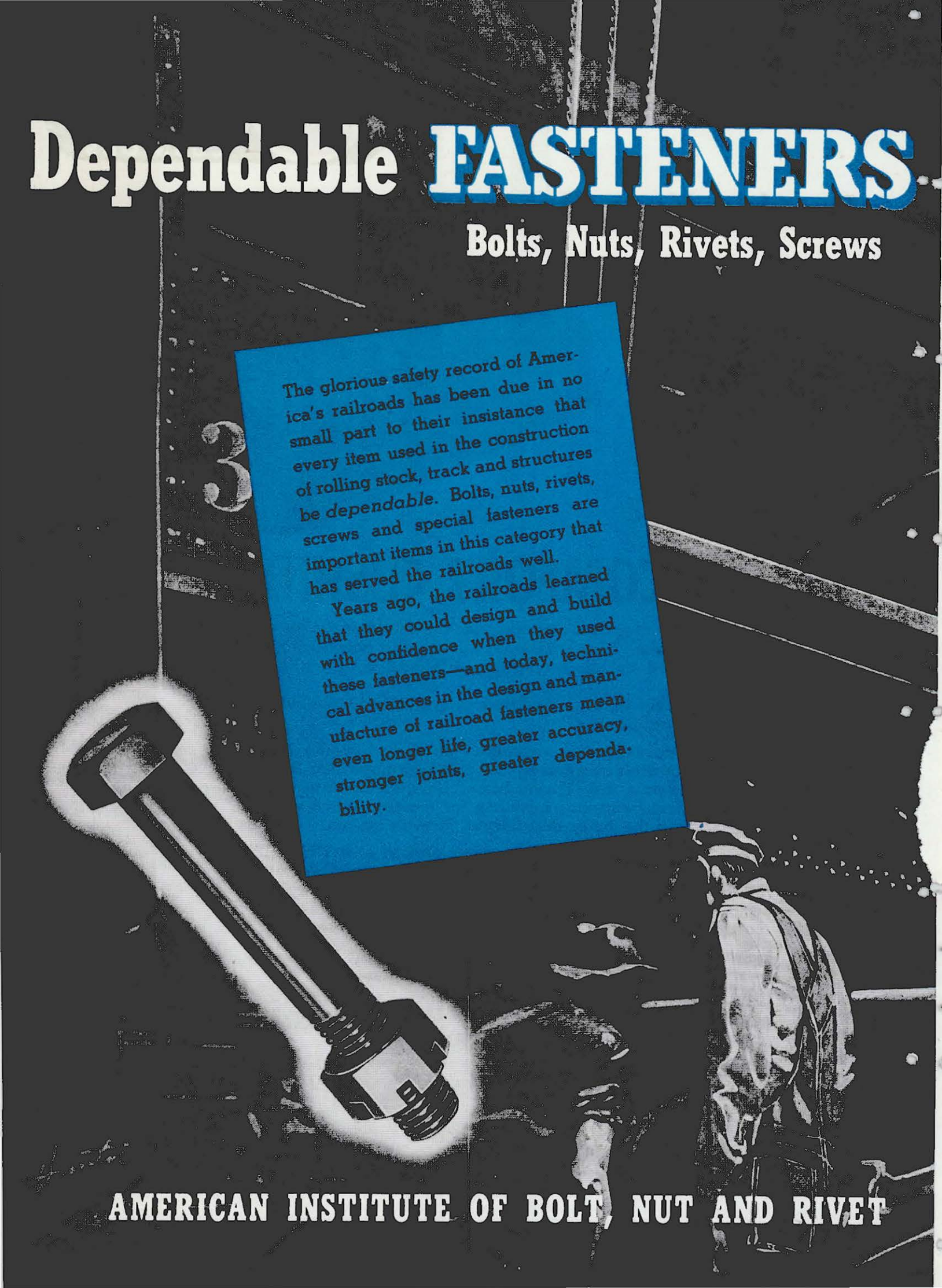
SALES OFFICES: 661 Godfrey Ave., S. W., Telephone 6-1481, GRAND RAPIDS

CHICAGO — 205 W. WACKER DRIVE — FRanklin 5780

DETROIT — 911 FISHER BUILDING — MAdison 4425

Dependable FASTENERS

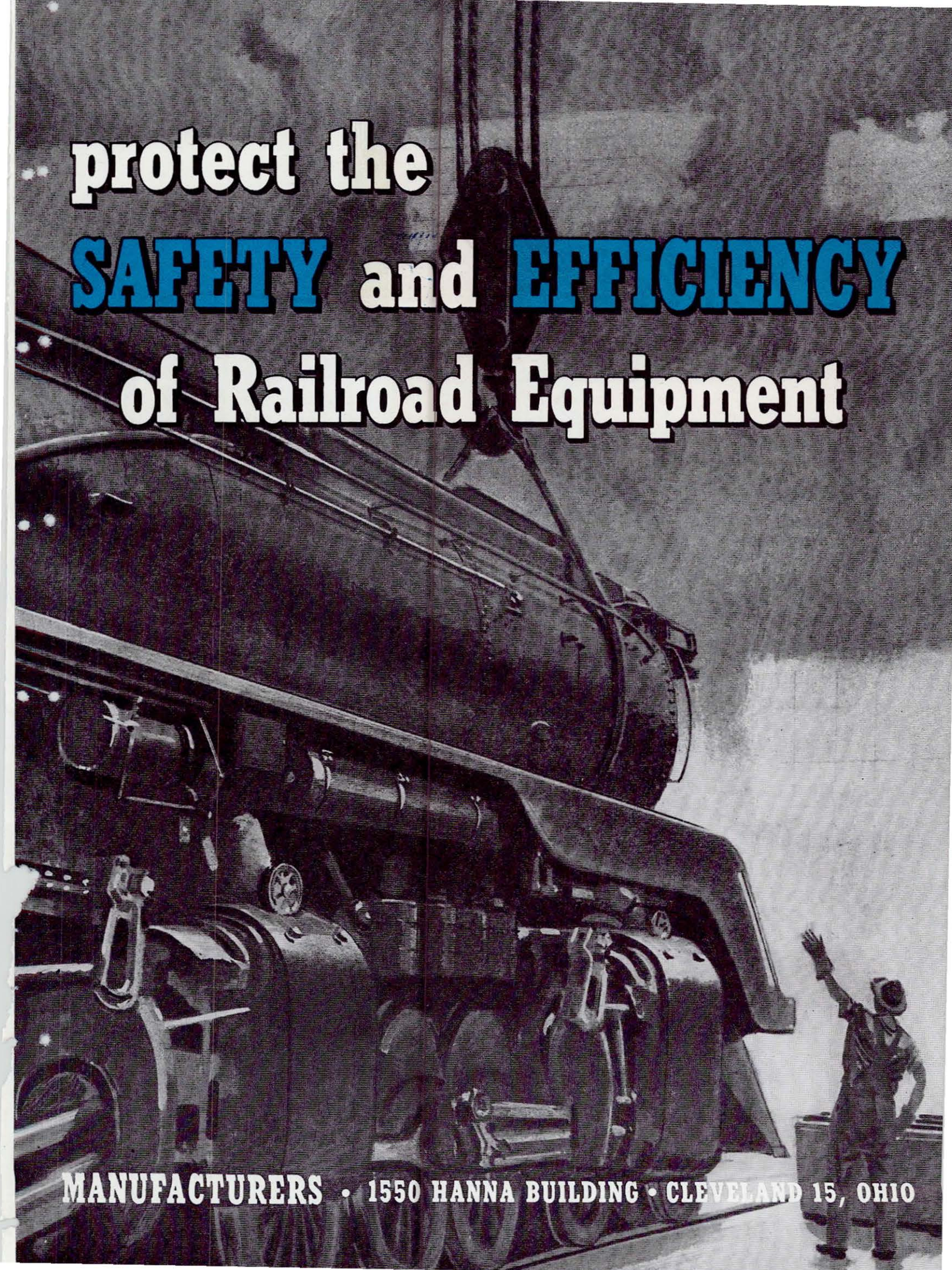
Bolts, Nuts, Rivets, Screws



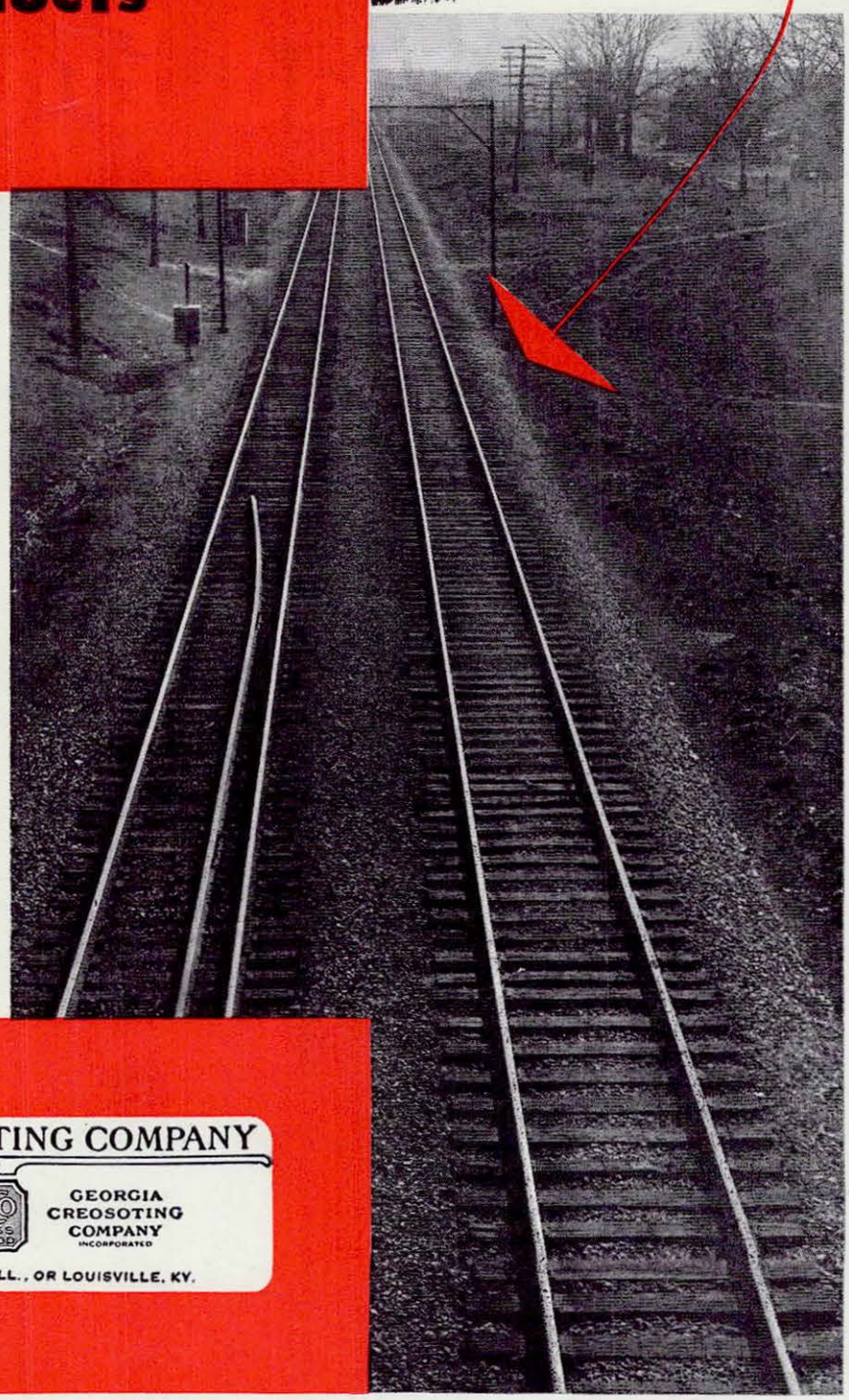
The glorious safety record of America's railroads has been due in no small part to their insistance that every item used in the construction of rolling stock, track and structures be *dependable*. Bolts, nuts, rivets, screws and special fasteners are important items in this category that has served the railroads well.

Years ago, the railroads learned that they could design and build with confidence when they used these fasteners—and today, technical advances in the design and manufacture of railroad fasteners mean even longer life, greater accuracy, stronger joints, greater dependability.

AMERICAN INSTITUTE OF BOLT, NUT AND RIVET


protect the
SAFETY and EFFICIENCY
of Railroad Equipment
MANUFACTURERS • 1550 HANNA BUILDING • CLEVELAND 15, OHIO

Amcreco Creosoted products



The lasting strength of Amcreco creosoted products minimizes maintenance expense

- ADZED AND BORED CROSS TIES
- BRIDGE TIES
- PILES
- FRAMED BRIDGE TIMBERS

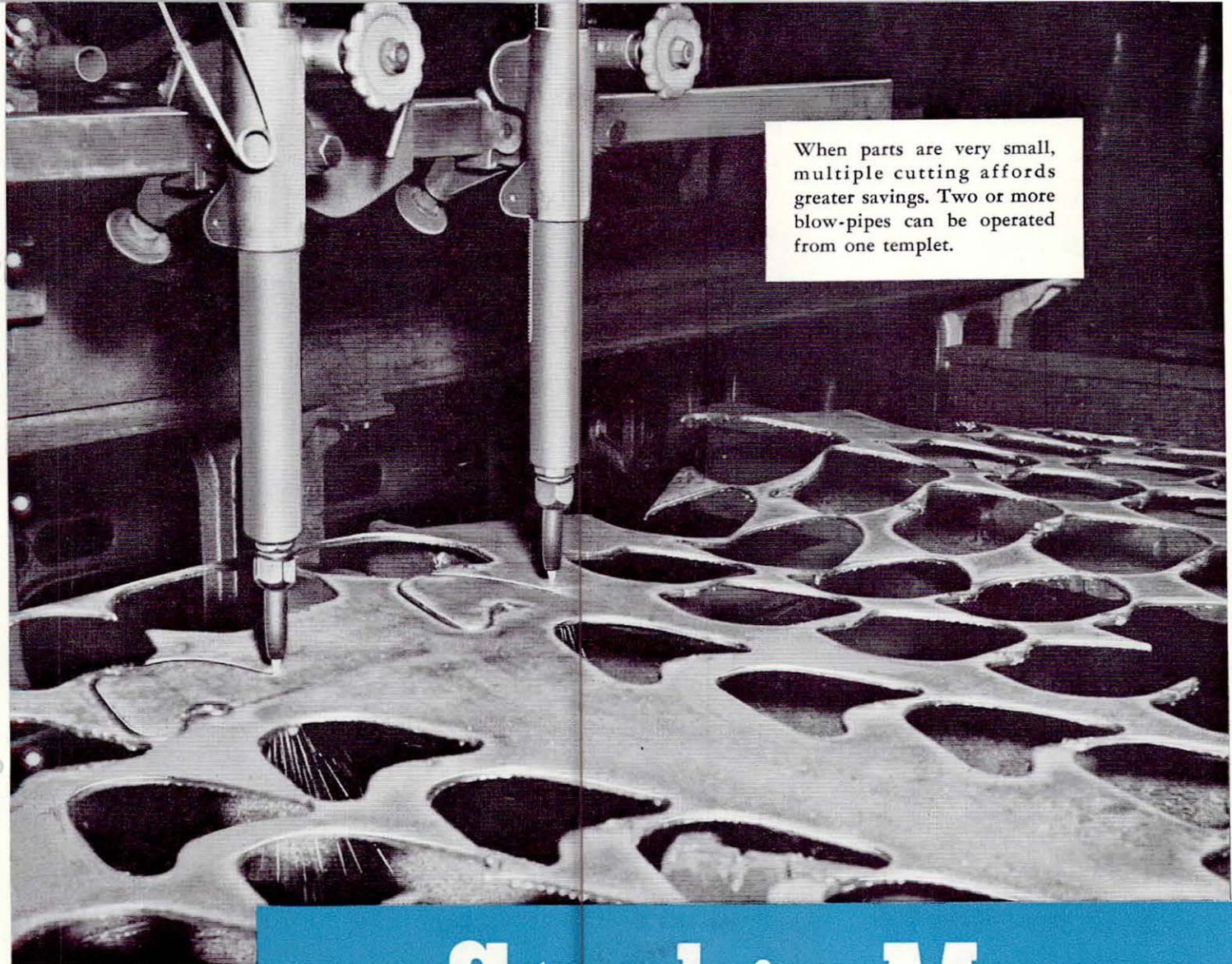
AMERICAN CREOSOTING COMPANY
INCORPORATED

COLONIAL CREOSOTING COMPANY INCORPORATED

AMCREO LOWRY PROCESS CREOSOTED WOOD

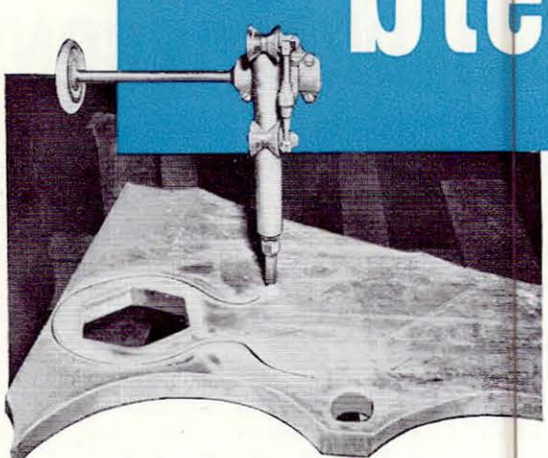
GEORGIA CREOSOTING COMPANY INCORPORATED

ADDRESS INQUIRIES TO CHICAGO, ILL., OR LOUISVILLE, KY.



When parts are very small, multiple cutting affords greater savings. Two or more blow-pipes can be operated from one templet.

Steel is Money



Needed small parts such as wrenches, washers, gusset plates or step plates can be cut from scrap metal.

Oxy-acetylene flame-cutting saves steel. Scrap metal is still usable plate — can be used to produce small parts. Ask an Oxweld representative to help you lay out and plan cuts to reduce scrap loss to a minimum.

THE OXWELD RAILROAD SERVICE COMPANY

Unit of Union Carbide and Carbon Corporation

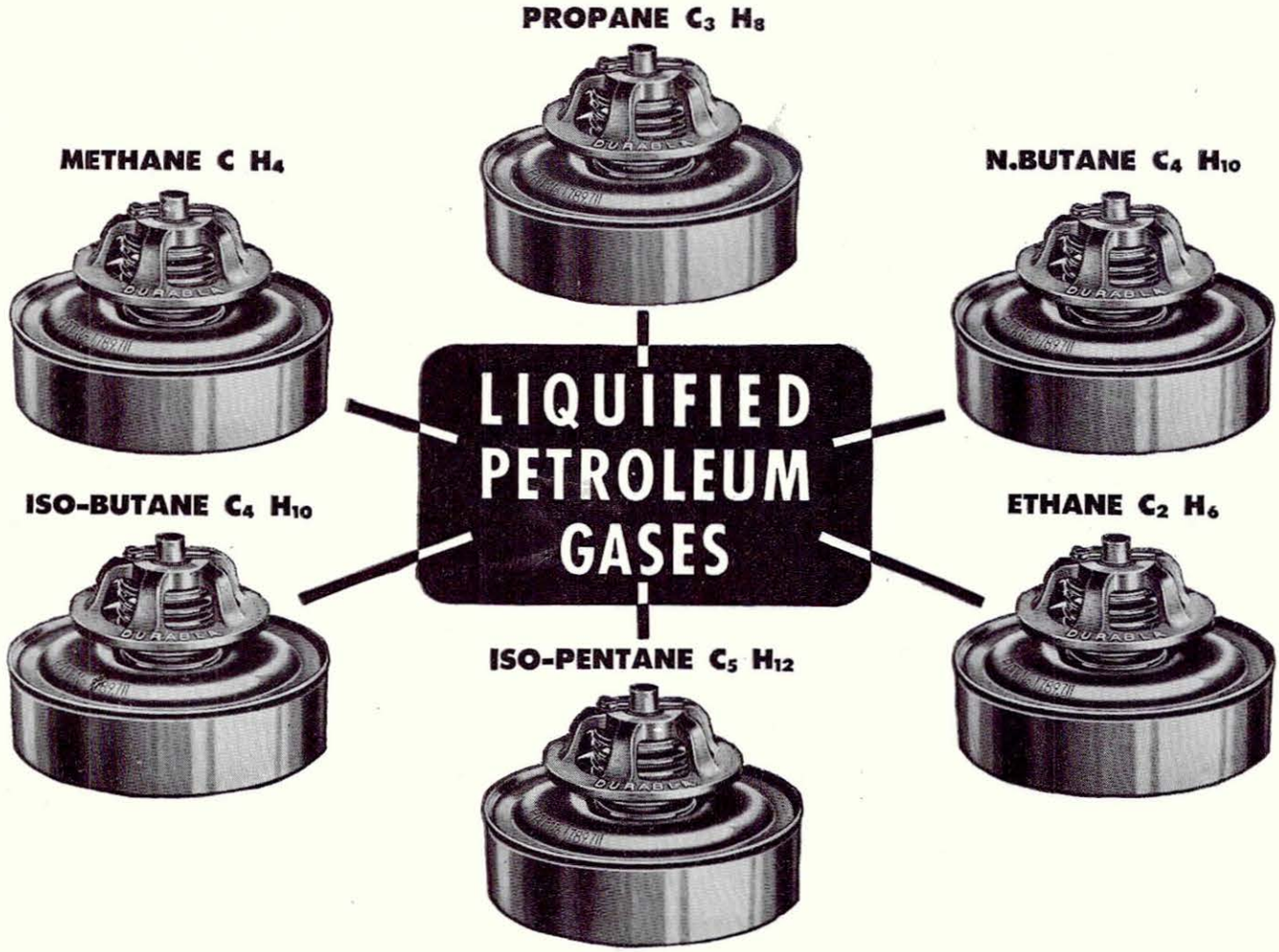
UCC

Carbide and Carbon Building Chicago and New York

In Canada:

Canadian Railroad Service Company, Limited, Toronto

SINCE 1912 — THE COMPLETE OXY-ACETYLENE SERVICE FOR AMERICAN RAILROADS



DURABLA PUMP VALVES FOR LIGHT HYDROCARBONS

When close clearance or any other design of reciprocating pumps are used for handling the greatly increased production of light hydrocarbons, DURABLA METAL PUMP VALVE UNITS* are your guarantee of high performance, freedom from "gassing" and replacement problems. The arched and curved shape of the valve member absolutely minimizes "slip", cavitation, and turbulence. DURABLA Valves are precision engineered, especially for this service.

Pump valves all open with a tilt action towards the flow line or line of least resistance. DURABLA Valves, being free-tilting, follow this natural law, which is not possible with high hub stem-guided valves or wing guided valves where large side friction is caused when they attempt to tilt in accordance with this basic law . . . and no other free tilting valve is as light as the DURABLA Valve.

ONLY DURABLA OFFER ALL THESE ESSENTIAL FEATURES FOR LIGHT HYDROCARBON SERVICE

- Feather Weight Valve Member
- Free-Tilting Valve Member Without Side Friction
- Snap Action Under Any Load
- Positive Seal Independent of Contraction and Expansion of Gases
- Does Not Need Lubrication
- Compact Design, Stocked in 11 Standard Sizes to Fit Any Pump

Write DURABLA Engineering Department for information and Bulletin, Reference 6A8

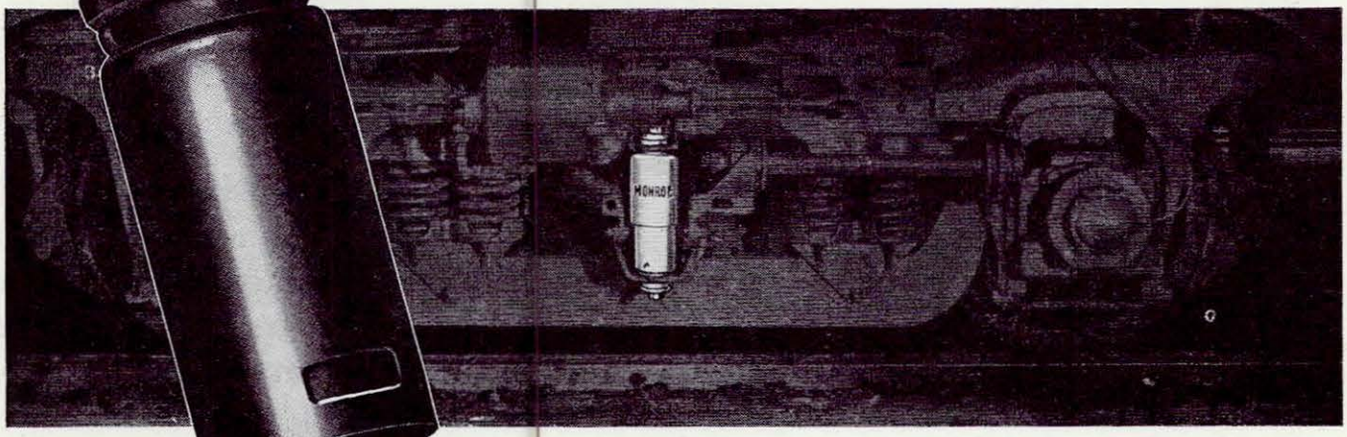
*Patent Numbers 2090486, 2117504

DURABLA MANUFACTURING COMPANY
114 LIBERTY ST. NEW YORK
BRANCHES IN PRINCIPAL CITIES. FOR CANADA REFER: CANADIAN DURABLA LIMITED, TORONTO

MONROE

Hydraulic SHOCK ABSORBERS

...Insure **MORE UNIFORM ACTION —LONGER EFFICIENT SERVICE**



Typical railway installation of Monroe Vertical Hydraulic Shock Absorber

Built on principles proved over millions of railway car miles, Monroe's new Direct-Double-Action Hydraulic Shock Absorbers are quickly and easily installed without disturbing existing spring capacity. Because they are hydraulic, they insure more uniform action and longer efficient service.

Monroes are your answer both in designing new lighter weight cars and in rehabilitating rolling stock. They check progressive harmonic motion... control vertical and swaying action... protect lading, equipment, roadbed... reduce maintenance costs and damage claims... make higher speeds safer, more practicable.

Write or wire for full details before setting pencil to paper. Monroe engineers immediately available to work with you on installations of Monroe Hydraulic Shock Absorbers to your equipment.

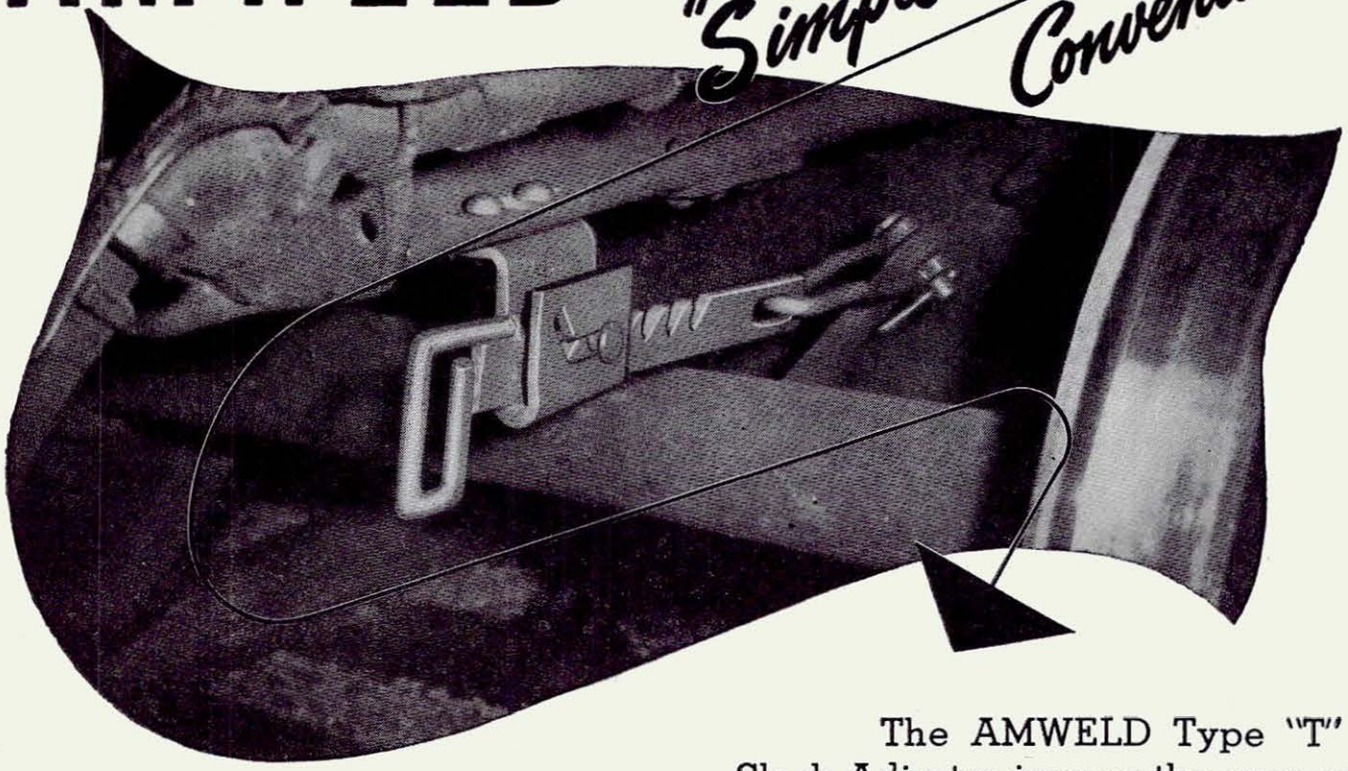
RAILWAY SUPPLY DIVISION
CHICAGO OFFICE
3001 Willoughby Tower Bldg.
WASHINGTON, D. C., OFFICE
1028 Connecticut Ave., N.W.

MONROE AUTO EQUIPMENT CO., MONROE, MICH.

AMWELD TYPE "T" SLACK ADJUSTER

— PATENTED —

"Simple and Convenient"



The AMWELD Type "T" Slack Adjuster insures the proper operation of brake equipment and makes it possible to maintain piston travel within the specified limits by a simple pull on a convenient handle.

Consider the importance of:

Application to any type of freight car equipped with bottom rod.

Equalization or balance of brake force in car body and truck.

Simplicity in application and operation.

Replacement of the standard or conventional dead lever guides and dead lever guide brackets.

For more detailed information, please write us.

RAILWAY EQUIPMENT DIVISION

THE AMERICAN WELDING & MANUFACTURING CO.

WARREN, OHIO

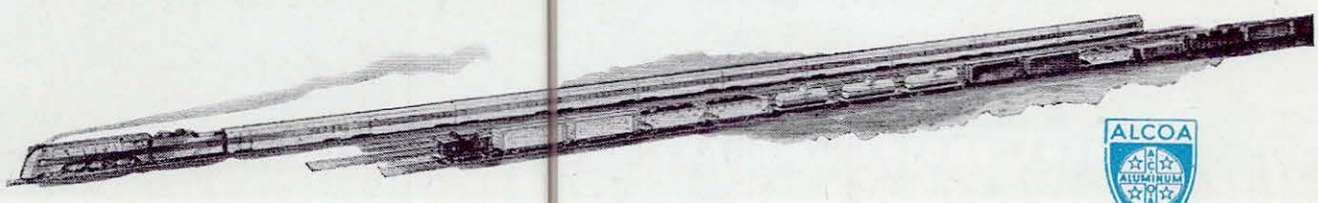
What in Tunket are they Jabberin' about, Jonathan?

THE OLD HOGGER has a right to be puzzled. It's enough to pull you up short when you stop and think what's happened in the last fifty years of railroading—yes, even the last twenty-five. But it adds up!

It adds up now—in 1946—to a rich combination of materials and facilities, the like of which has never been available in railroad history. A combination that cannot but make the train of the future a safer, more beautiful, more efficient train than ever before.

The organizations supplying these new materials and techniques stand ready to give the railroads all possible help in applying them. Alcoa, for instance, gladly offers its years of pioneering in the adaptation of aluminum to railroad needs. There are no strings tied to this world's richest fund of aluminum knowledge—Alcoa Aluminum, combining strength with lightness, corrosion-resistance with easy workability, will find its place among all of the other materials available.

With such materials and facilities, and with a mandate from the public based soundly on American appreciation of an "impossible" war job done and done well, American railroads have a clear board. ALUMINUM COMPANY OF AMERICA, 2178 Gulf Building, Pittsburgh 19, Pennsylvania.

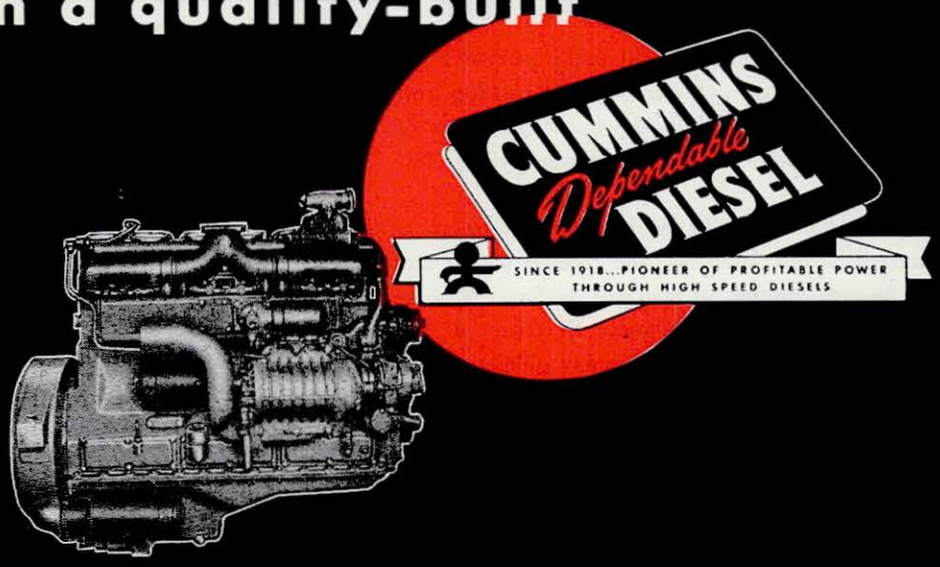


ALCOA FIRST IN ALUMINUM REG. T. M.

Predictable . . .

more profitable work-hours

with a quality-built



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1030 Leggett Avenue, New 55, New York

GRIFFIN
CHILLED CAR WHEELS

Each of Griffin's 12 plants maintain an ample stock of Standard AAR chilled wheels. Shipment can be made immediately upon receipt of order.

Minimize the haul on new and scrap wheels by placing your order with the nearest Griffin plant.

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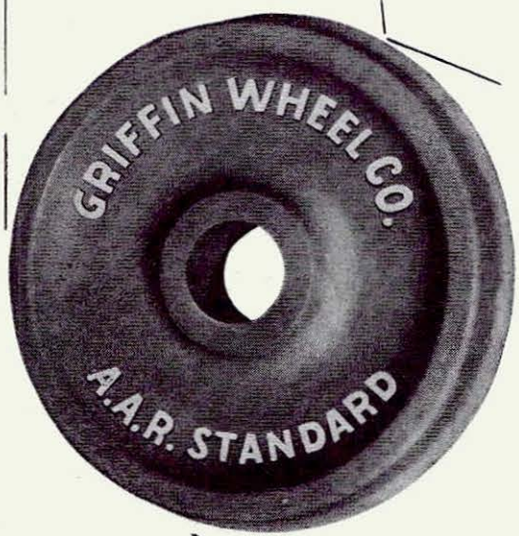

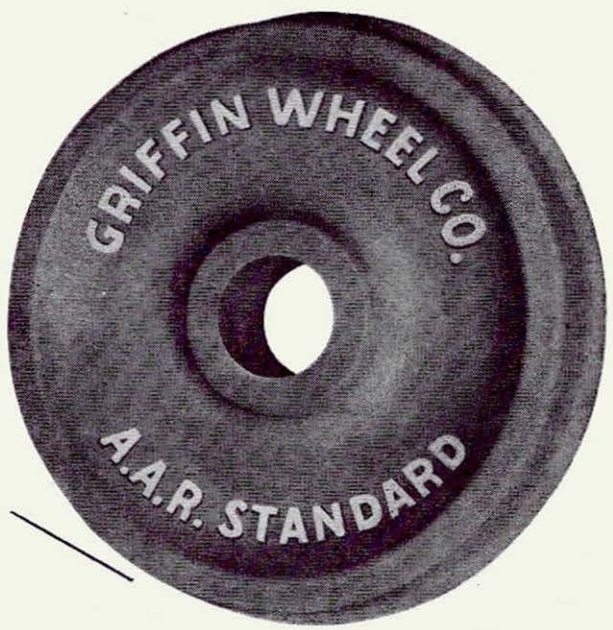

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STREAMLINE YOUR PAINTING

THROUGH **COLOR STRATEGY**

planned by . . .

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Pacemaker in Paints

THE SYMBOL OF COLOR AUTHORITY

For color prescriptions or technical service on any railroad painting problem, write

THE GLIDDEN COMPANY
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RACOR
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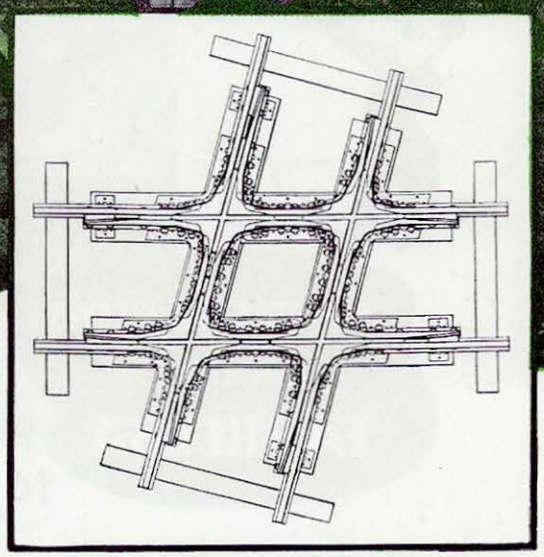
Manganese steel reversible insert crossing



Has **REVERSIBLE DESIGN** — permits transposing of casting, greatly reducing maintenance and replacement costs.

Has **DEPTH HARDENED TREAD INTERSECTIONS** — an initial work-hardening process is applied at the factory before crossing is installed in track—retards batter and flow of metal into flangeways.

Has **INTEGRAL BASE DESIGN** — structurally reinforced—supports factory depth hardening process, as well as traffic impact.

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AMERICAN Brake Shoe COMPANY

Pioneers in the development and manufacture of

DEPTH HARDENED CROSSINGS	SAMSON SWITCH POINTS
AUTOMATIC SWITCH STANDS	VERTICAL SWITCH RODS
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World's most complete line of Track Specialties

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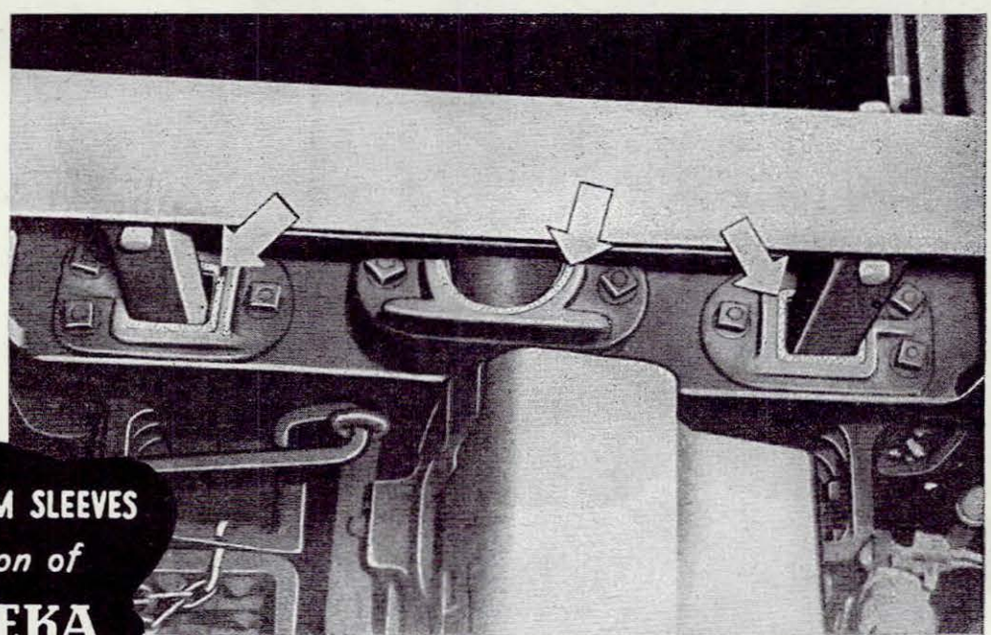
Ramapo's greater experience and facilities are ready to serve you.

Only Ramapo has plants from coast to coast to expedite America's Railroad needs.

Call for -and Make Sure You Get FABREEKA



BUFFER STEM SLEEVES
application of
FABREEKA

TO ABSORB SHOCK, ISOLATE VIBRATION and REDUCE NOISE

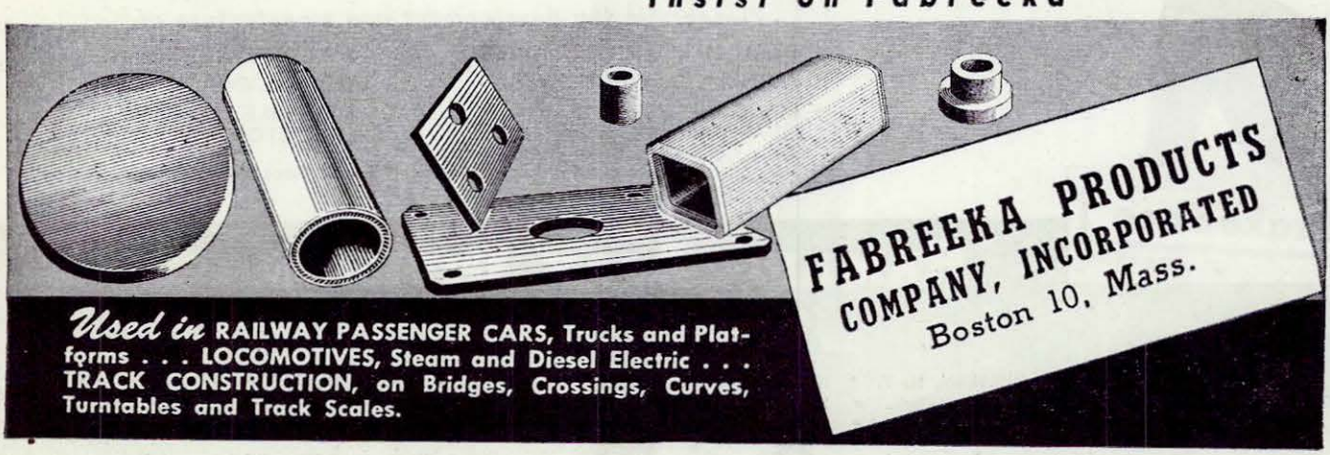
Some Important Uses of FABREEKA On Passenger Cars:

1. At Coil Springs.
2. At Center Plates.
3. At Buffer Stems.
4. At Swing Hanger Bearings.
5. At Side Bearings.
6. At Journal Boxes.

Because of its unique structure and design, only FABREEKA can give extremely long life and effectively absorb shock, isolate transmitted vibration and reduce noise. This fact has been proven by more than 12 years' use on the nation's railroads.

We call your attention to these eight important characteristics of FABREEKA: **Long Life . . . Great Strength . . . Minimum Permanent Set . . . Used "In Compression" . . . Limited Resiliency . . . Stability . . . Safety . . . High Damping.**

"Insist on Fabreeka"



Used in **RAILWAY PASSENGER CARS, Trucks and Platforms . . . LOCOMOTIVES, Steam and Diesel Electric . . . TRACK CONSTRUCTION, on Bridges, Crossings, Curves, Turntables and Track Scales.**

FABREEKA PRODUCTS COMPANY, INCORPORATED
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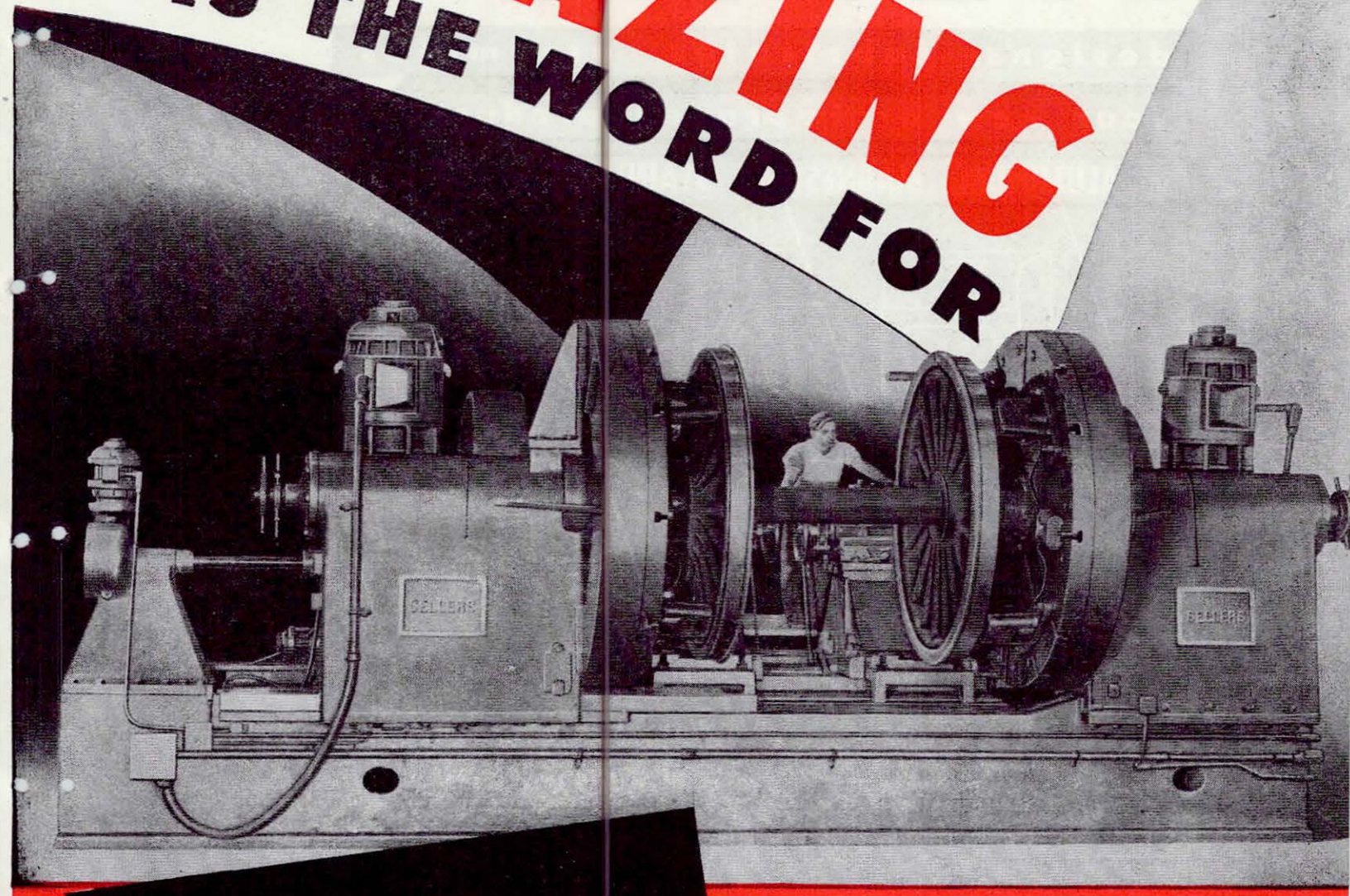
AMAZING
IS THE WORD FOR



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WHEEL LATHE . . .

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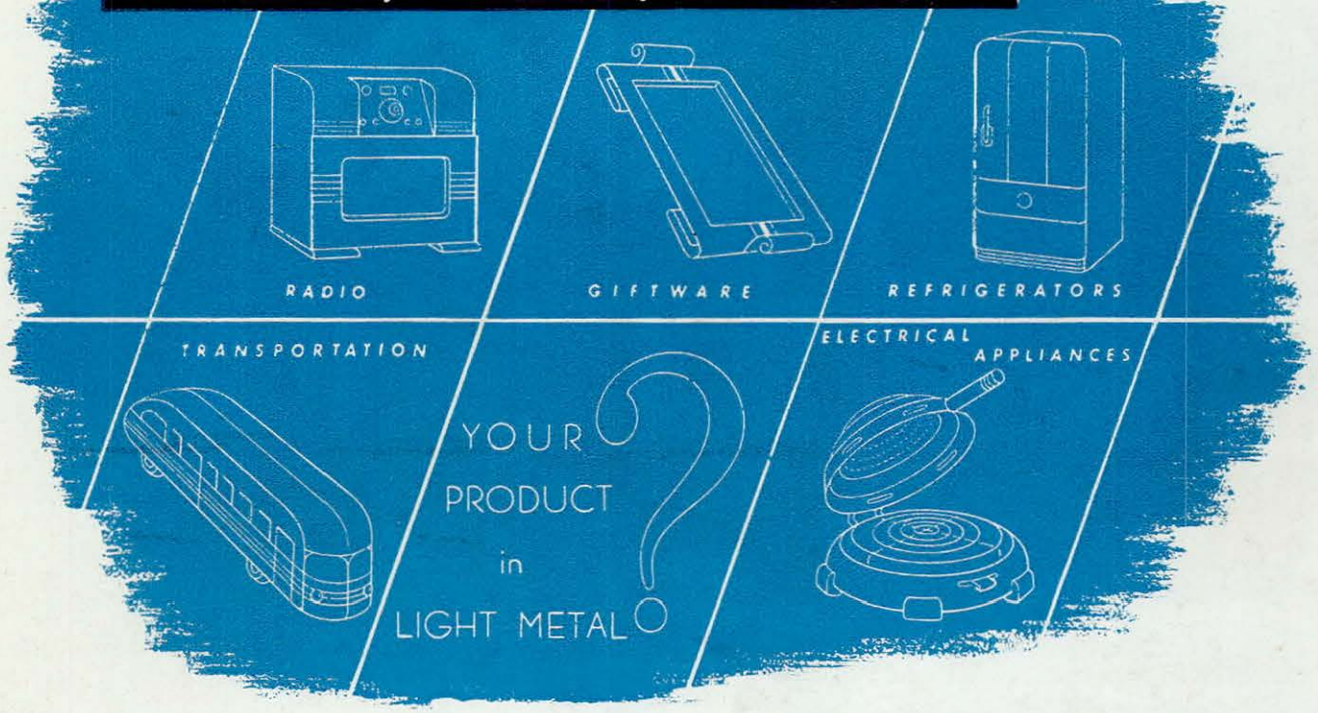
designs, fabricates, assembles
your new or improved product
in ALUMINUM, MAGNESIUM, STAINLESS STEEL



You name it, and let COLGATE work out a design with you. Then let us make it, partly or completely, fabricating and assembling your new or re-designed product from Aluminum, Magnesium, or Stainless Steel to give it these sales creating features—*lighter weight, added beauty, increased strength and durability, improved product performance, lower fabricating costs, reduced shipping weight.*

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LIGHT METAL PRODUCTS DIVISION

How Railways use Elwell-Parkers to speed materials through all Departments

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Sent to you by the Men who are helping Industry to Create Better Ways for Handling Bigger Loads
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POWER INDUSTRIAL TRUCKS AID IN MAKING OTHER RAILWAY FACILITIES MORE EFFECTUAL

Use coupon, get new Booklet tracing outstanding success installing Trucks to reduce costs in Terminals, Shops, Stores

READY for you today—Elwell-Parker's new, official Bulletin that ties right into present-day railway installations. Brings information on modern ways to **(a)** expand volume handled at each Truck trip; **(b)** increase speed and **(c)** insure safety, creating new savings that quickly pay for your Truck investment.

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Employing the correct containers (Boxes, Barrels, Bags or Bales) in Master Unit Loads, on Pallets or Skids;

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Please attach to your letterhead, and mail to Elwell-Parker, Cleveland:

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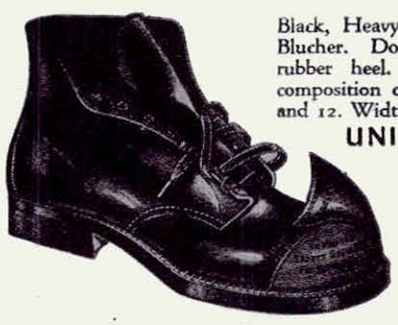
LOOK

LISTEN

On some twenty-three railroads in the United States our steel toe safety shoes can be purchased in the railroads' company stores on a pay roll deduction plan. If the railroad where you are employed is one of those having our service, you will find the right shoe for your job made of the right materials to give WEAR and also a correct fit to give COMFORT. Ask your nearest Railroad Stores Department for information.

Shoes for TRACKMEN — WAREHOUSEMEN — SHOPMEN — TRAINMEN — FOREMEN

HEAVY OUTSIDE WORK



Black, Heavy, Work-Shoe Leather Blucher. Double leather outsole, rubber heel. Also available with composition outsole. Sizes 5 to 11 and 12. Widths D, EE.

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Safety First SHOE COMPANY

HOLLISTON, MASSACHUSETTS

Makers of Industrial Shoes for a Half Century

Red Lead
NEUTRALIZES ACIDS
that Speed Up Rusting

Every maintenance engineer knows that Red Lead has long been the outstanding protective paint for metal.

But did you know that one of the important reasons is the ability of Red Lead to counteract the acid conditions which are recognized as accelerators of rust?

Structural steel is usually exposed to acid environments. This is so because acid-forming compounds are produced by certain gasses and smoke in contact with moisture. Pollution of waterways also results in acidity.

Moreover linseed oil, synthetic resin varnishes and other commonly used paint vehicles *themselves* produce organic acids in the normal process of aging. Many of these also accelerate corrosion.

When Red Lead is the pigment in a protective paint, rust-causing acidity is kept under control. Actually, a "controlled" acid level is maintained in the paint film. This is a singular property of Red Lead and also contributes to the utmost in film flexibility, impermeability and long life.

* * *

The value of Red Lead as a rust preventive is most fully realized in a paint where it is the only pigment used. However, its rust-resistant properties are so pronounced that it also improves any multiple pigment paint. No matter what price you pay, you'll get a better paint for surface protection of metal if it contains Red Lead.

* * *

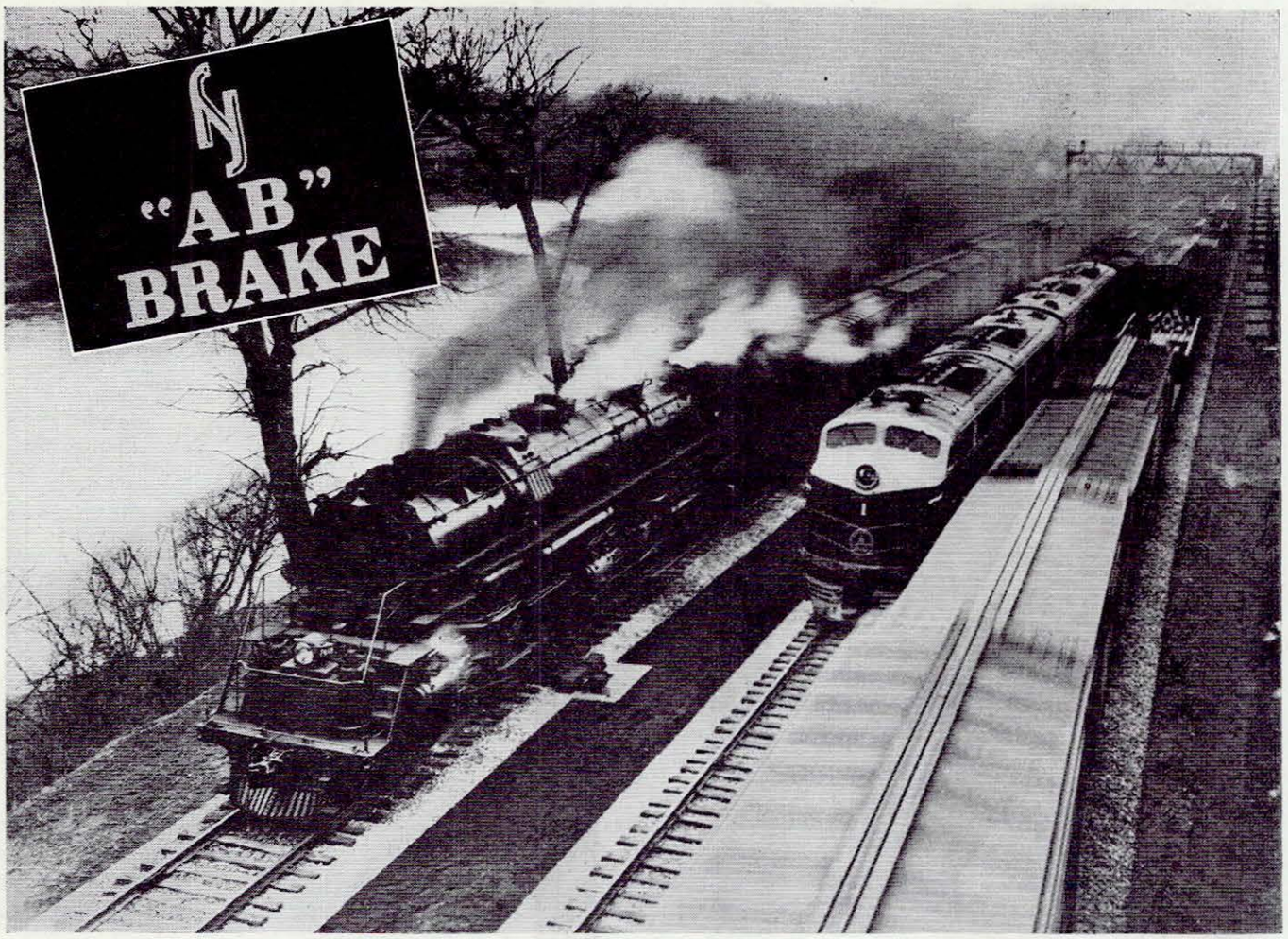
Write for New Booklet—"*Red Lead in Corrosion Resistant Paints*" is an up-to-date, authoritative guide for those responsible for specifying and formulating paint for structural iron and steel. It describes in detail the scientific reasons why Red Lead gives superior protection. It also includes typical specification formulas. If you haven't received your copy, address nearest branch listed below.

* * *

The benefit of our extensive experience with metal protective paints for both underwater and atmospheric use is available through our technical staff.

NATIONAL LEAD COMPANY: New York 6; Buffalo 3; Chicago 80; Cincinnati 3; Cleveland 13; St. Louis 1; San Francisco 10; Boston 6, (National Lead Co. of Mass.); Philadelphia 7, (John T. Lewis & Bros. Co.); Pittsburgh 30, (National Lead Co. of Pa.); Charleston 25, W. Va. (Evans Lead Division).

Dutch Boy
Red Lead



GENERAL *All Around Improvement* IN OPERATING EFFICIENCY

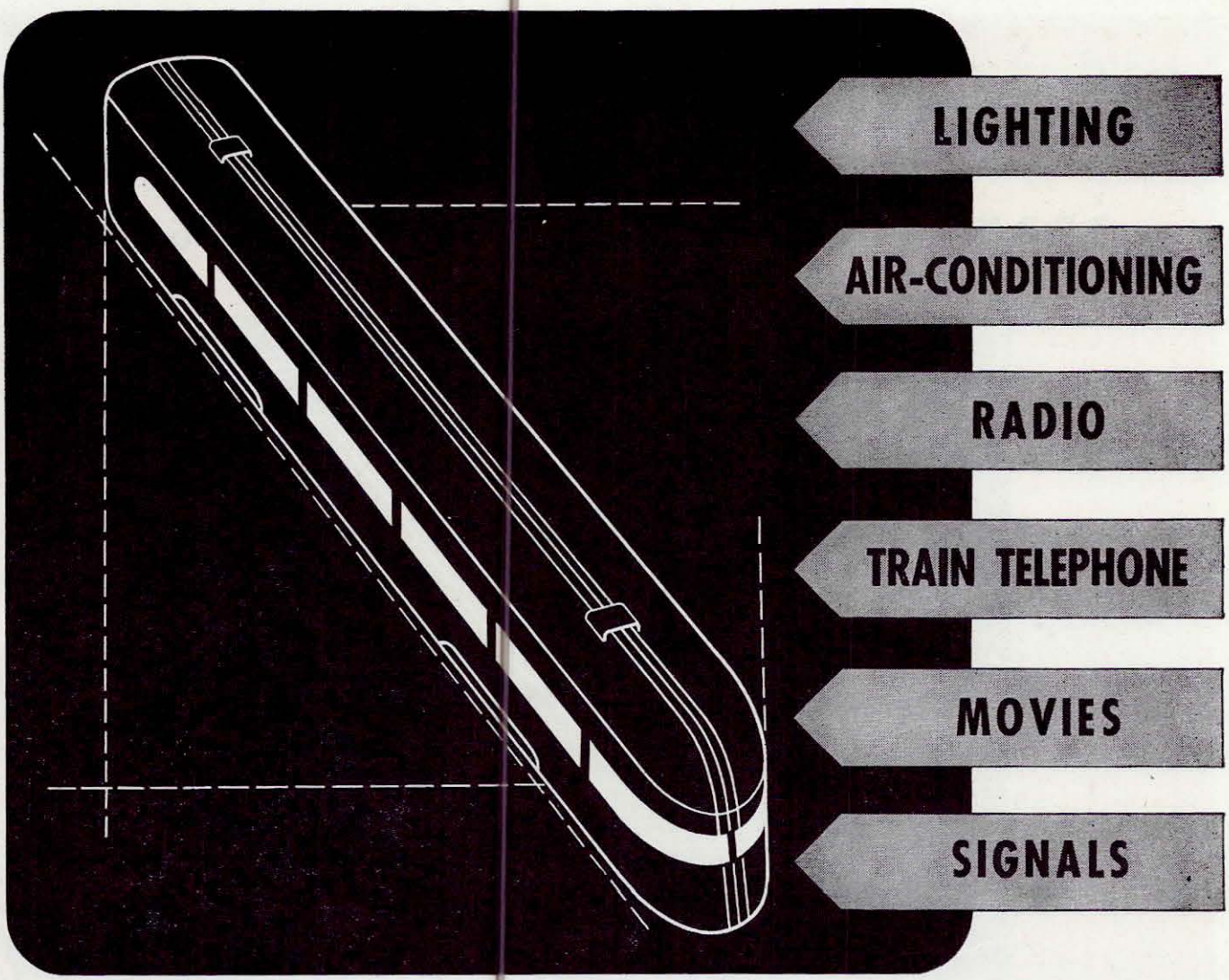
CALL the roll of improvements in modern freight train operation and you find that much of this progress was achieved with the aid of the "AB" Air Brake. Increase in ton miles per car per locomotive — maintenance of "tight" schedules — ample protection for lading and equipment — these are all paced by a rapid, flexible retardation control at all speeds.

The smooth, positive action of the "AB" Brake permits higher speeds safely. Calibration for better slack control reduces damage claims and equipment maintenance costs. Cars on the longest trains are protected against excessive shocks.

Follow the trend to complete standardization with "AB" Brakes — the resulting operating economies are substantial.

The New York Air Brake Company

420 Lexington Ave., New York 17, N.Y. **Plant: Watertown, N.Y.**



EXIDE POWER is ready to meet those newer battery needs...

Wherever new passenger car plans are being drawn, high among the "musts" are added comforts and conveniences for the traveler. Many will be electrical, calling for storage battery power that is capable of meeting every demand made upon it.

Since 1891, Exides have been serving America's railroads. Today, on thousands of cars, Exides are keeping lights bright and air-conditioning units functioning smoothly even during long stops. They are cranking Diesel locomotives . . . powering signal and track circuits . . . performing other storage battery duties. And Exides are ready and able to take on those new, extra duties. Whatever the service, you can count on Exides for dependability, long-life and ease of maintenance.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • Exide Batteries of Canada, Limited, Toronto

We are equipped to forge

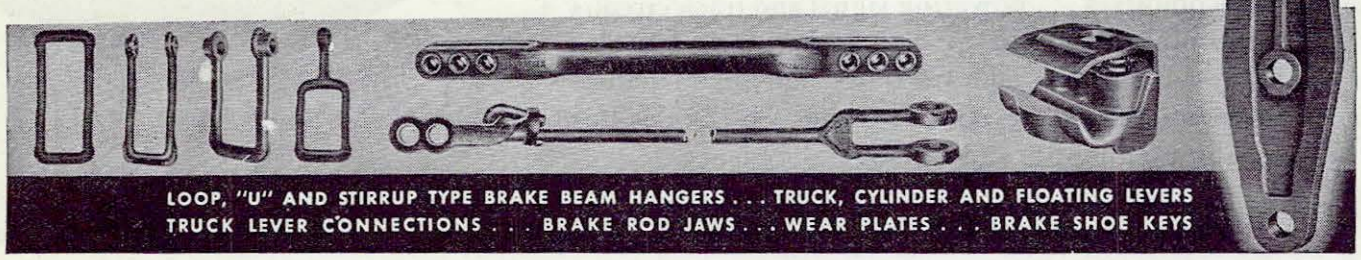
BODY LEVERS UP TO 52½" IN LENGTH

In connection with new cars now in design, remember that Schaefer can forge body levers up to 52½"—can cut lever weight one-third—show more strength than a solid lever—and, by using our *own* pad structure, take care of all intermediate length variations.

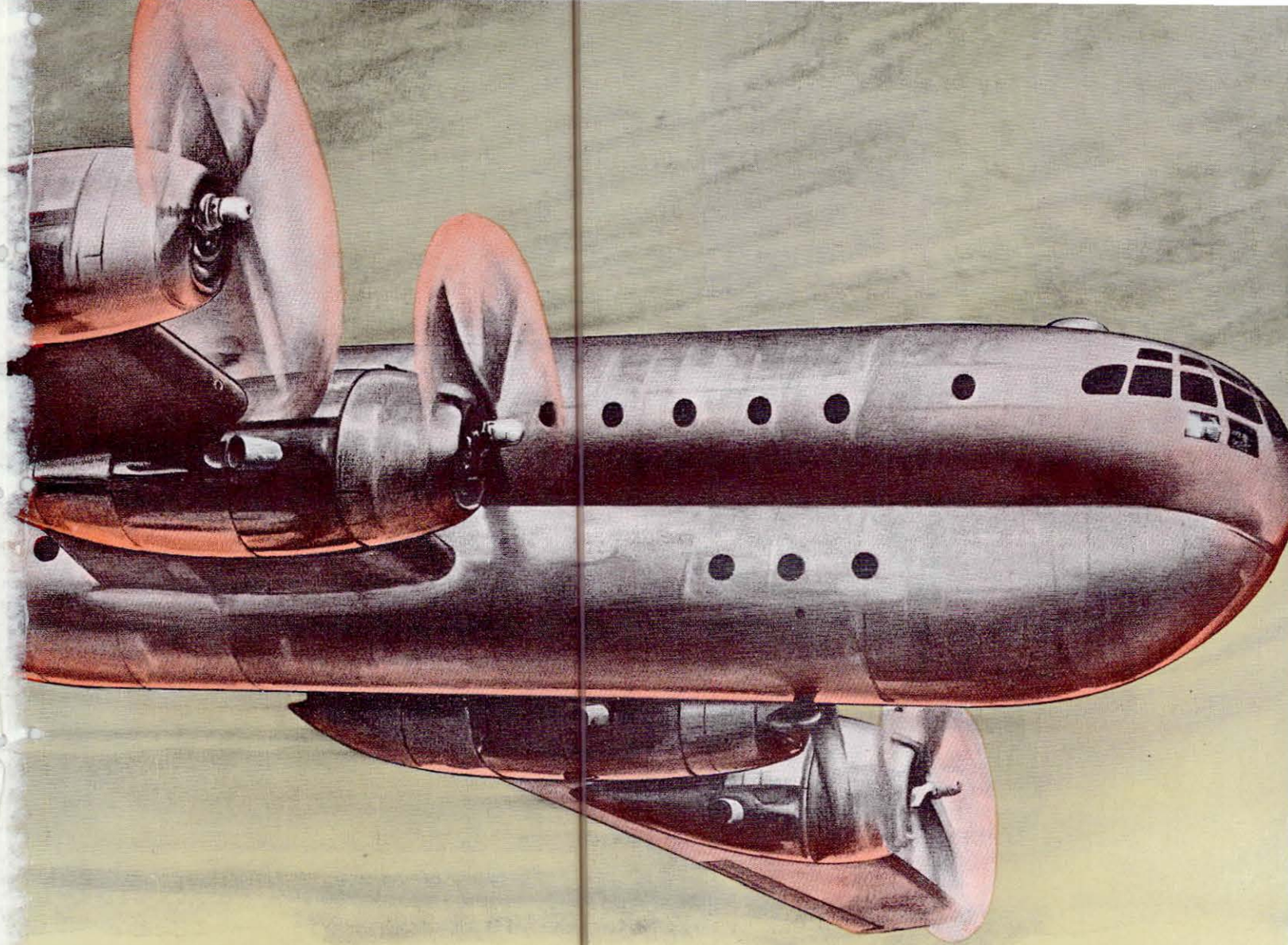
Write for Catalog No. 445

Schaefer EQUIPMENT COMPANY

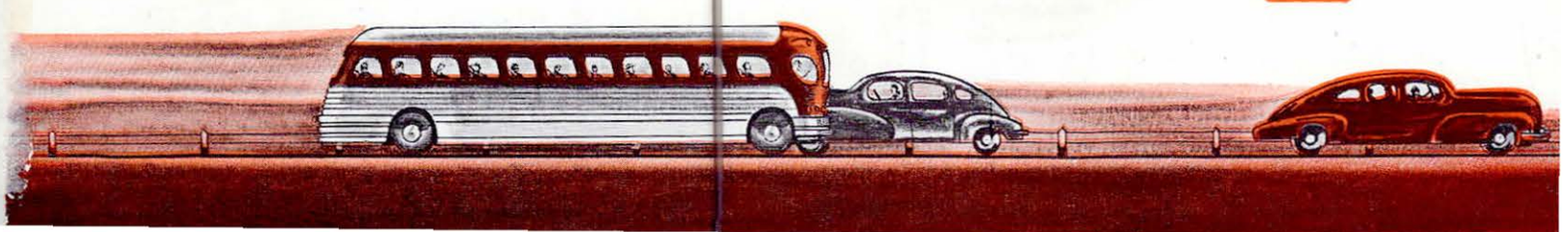
KOPPERS BUILDING • PITTSBURGH, PA.



LOOP, "U" AND STIRRUP TYPE BRAKE BEAM HANGERS . . . TRUCK, CYLINDER AND FLOATING LEVERS
TRUCK LEVER CONNECTIONS . . . BRAKE ROD JAWS . . . WEAR PLATES . . . BRAKE SHOE KEYS



WHAT CAN YOU DO TO MEET THIS COMPETITION?



MAKE PASSENGERS SAY:

"Never have I enjoyed such travel Comfort"

NOT 1/2 WAY COMFORT

IT IS NOT enough to provide *some* comfort. Reclining chairs and air conditioning help but passengers want more than "½ Way Comfort". They want 100% comfort which means 100% freedom from jerks, jolts and jars.

To eliminate tiring vibration from railroad travel, to assure complete relaxation and travel enjoyment equip *all* passenger cars, new cars and existing cars with Waughmat Twin-Cushions.

APPLY TO NEW OR EXISTING CARS

h complete

FORT

FOR 100% COMFORT ADD

WAUGHMAT *Twin Cushions*

Progressive Railroads

EQUIPPING THEIR NEWEST AND FINEST PASSENGER CARS WITH TWIN CUSHIONS:

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UNION PACIFIC
NEW YORK CENTRAL
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BURLINGTON
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NORTHERN PACIFIC
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TEXAS & PACIFIC
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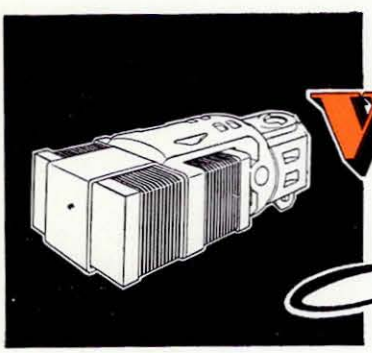
8870

41 OF ALL PASSENGER CARS BUILT SINCE ARE TWIN CUSHION EQUIPPED



WAUGHMAT ★ Twin Cushions

ELIMINATE JERKS AND JARS

★ **CAN BE APPLIED TO OLD OR NEW CARS**

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SUPERIOR for the Pacemaker

Cars for the new *Pacemaker* freight service of the New York Central have SUPERIOR STEEL CAR DOORS and Ball Bearing Door Fixtures . . . *SUPERIOR*

SUPERIOR for shipping

- *TIGHT SEALING*
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- *FREE ROLLING*
- *SMOOTH INTERIOR*
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McCORMICK BUILDING · CHICAGO

Pullman-Standard's

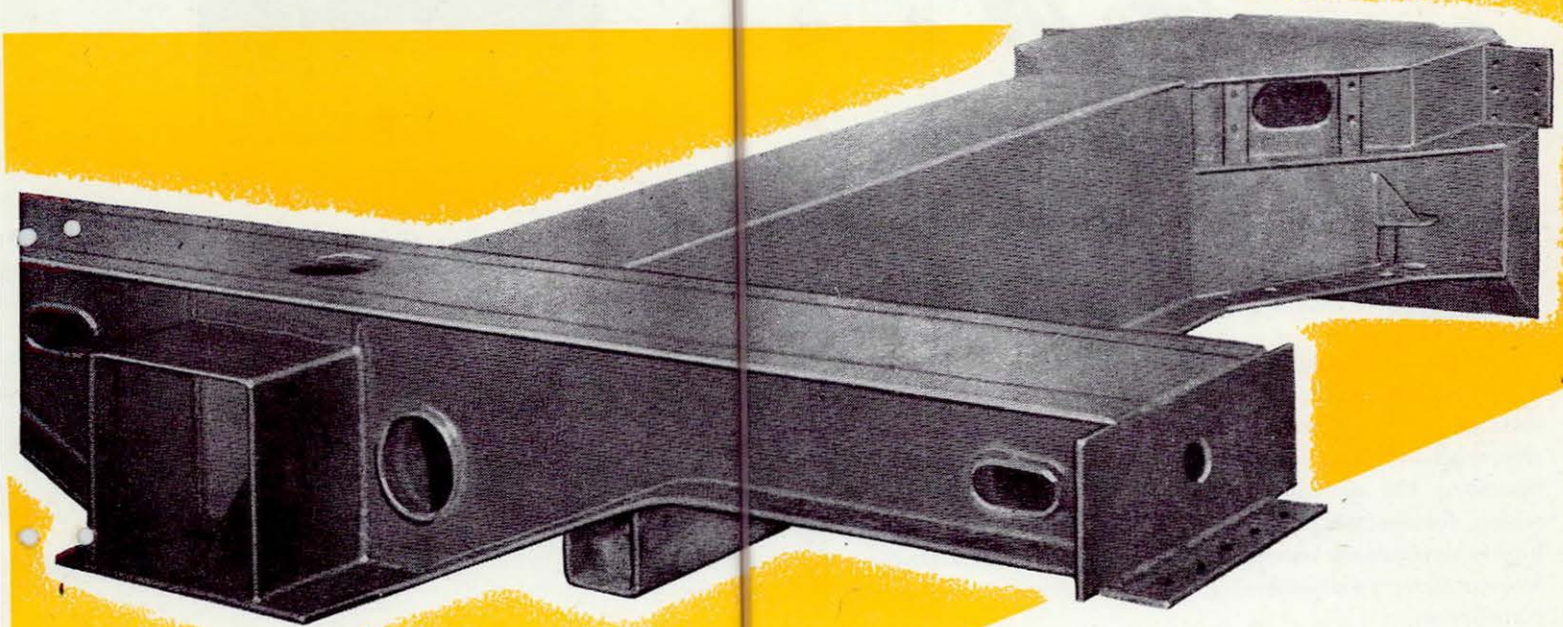
BOLSTER, DRAFT AND END SILL

- Saves weight.
- Exceeds A. A. R. strength requirements by 25%.
- In service for 4 to 6 years on 588 cars.
- Has proved its superiority.
- Now specified for hundreds of additional cars on order.

Pullman-

CHICAGO · NEW YORK

ASSEMBLY *for Passenger Cars*



RAILROADS SEEKING THE BEST HAVE SPECIFIED THIS CONSTRUCTION REPEATEDLY. THE RECORD RECOMMENDS IT FOR YOUR CONSIDERATION

Standard CAR MANUFACTURING COMPANY

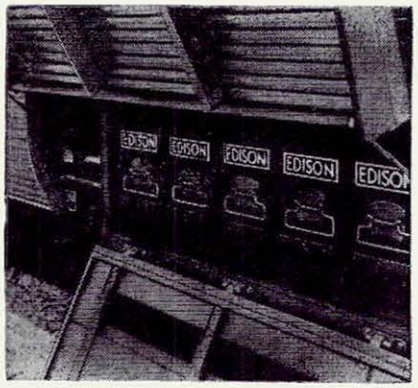
CLEVELAND · WASHINGTON, D. C. · PITTSBURGH · BIRMINGHAM · WORCESTER, MASS.

San Francisco Sales Representative, Mark Noble

WEIGHT GOES DOWN...

DEPENDABILITY UP...

when Alkaline Batteries Go IN ➡ ➡ ➡



Not only are Edison Alkaline Batteries the lightest weight type of battery available for railway-car service but their use saves weight where it counts most – near the middle of the car. The larger the kilowatt-hour capacity, the greater is the weight that can be saved by equipping cars with alkaline batteries.

An outstanding reason for their light weight advantage is their high-strength steel cell construction. This, together with their fool-proof electrochemical principle of operation give alkaline batteries unequaled dependability. You can have no better insurance of adequate capacity for operating the electrical luxuries and conveniences you provide for passenger comfort on post-war cars. Alkaline batteries have a long record of highly dependable service in 32-volt, 64-volt and 110-volt systems. *Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, New Jersey.*

Electrical features being planned for superlative passenger comfort and convenience on post-war cars emphasize the advantages of using batteries that can provide increased capacity with least additional weight and with greatest inherent dependability of operation. All of these requirements are met by Edison Alkaline Batteries.

Edison

THE LIGHTWEIGHT BATTERY
FOR LIGHTWEIGHT CARS

how you can use railroad radio to

cut switching time 15% or more

Here's a sound way to lick operating costs and raise profits; cut operating time in switching yards by 15%. More, in many cases.

Westinghouse railroad radio gives an engineer instant contact with another engine or yard office. Improved FM circuits assure noise-free communication. The system is as easy to use as the telephone itself, and no wayside wires are needed. Servicing is easy and spare part requirements are held to the minimum.

You get extra benefits with Westinghouse railroad radio, which was pioneered by Westinghouse more than 20 years ago . . . exclusively for railroad use. No other company can match the experience of Westinghouse in designing and operating radio equipment.

Railroads and Westinghouse have worked together more than 60 years to improve transportation and to lower costs. Westinghouse railroad radio offers one of the greatest opportunities to do this. Ask your nearest Westinghouse office for all the facts. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna.

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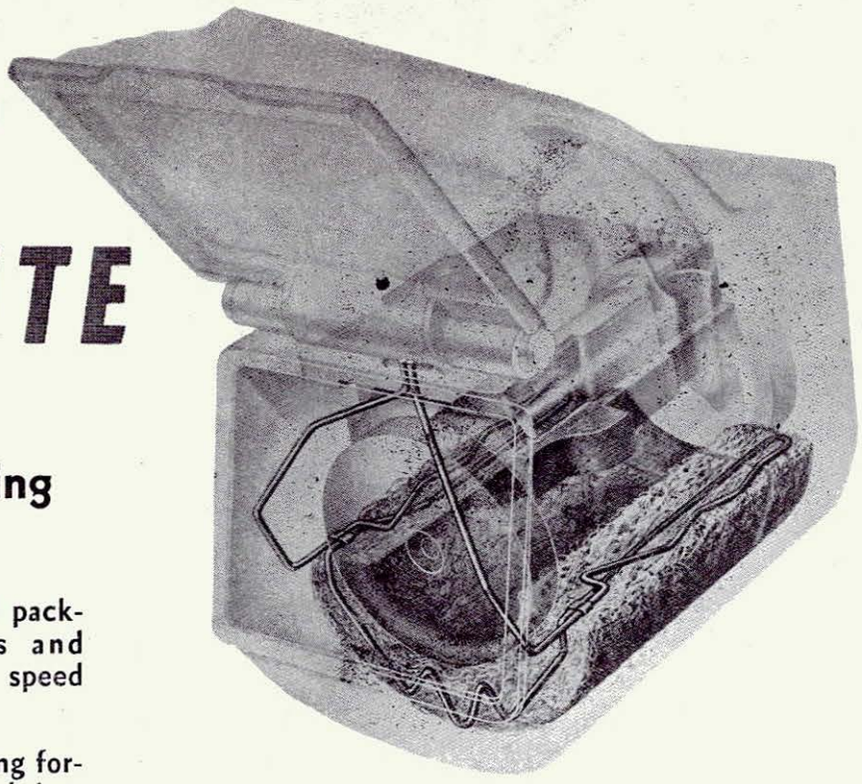
Westinghouse Railroad Radio

Electronics at Work

Rx For the prevention of

WASTE GRABS AND HOT BOXES



Improved

HOLD-RITE

Packing Retainers

Three Outstanding Features

1 Prevents displacement of packing under the shocks and jolts of switching and high speed operation.

2 Stops packing from moving forward thereby assuring lubrication at the back of the journal.

3 Automatic pumping action bringing oil to the top of the packing.

Over 1,700,000 HOLD-RITE Packing Retainers are in service on 75 railroads.

Write us now for complete information about HOLD-RITE Packing Retainers

SPRING PACKING CORPORATION

122 SOUTH MICHIGAN AVENUE **CHICAGO 3, ILLINOIS**

CRECO
THIRD POINT SUPPORT
holds brake rigging in alignment

THE sliding chair of the Creco Third Point Support rides on a flexible arm . . . presenting a cushioned movement that holds the brake rigging in the proper alignment.

The resiliency of this Third Point Support absorbs brake rigging vibration, and reduces brake head and brake shoe wear.

Moreover, the Third Point Support is a safety device, for it prevents a brake beam from falling to the track. The brake beam can be easily removed when desired.

CRECO
Brake Beam
SUPPORTS

Creco Brake Beam Supports mean economy in brake rigging maintenance costs, and safety in operation

CHICAGO RAILWAY EQUIPMENT CO.

McCormick Building — Chicago, Illinois

All aboard... to music!

Santa Fe Trains To Get Radio, Music Systems

In announcing forthcoming installation of musical wire reproducers, radio and public address systems on their passenger trains, Fred G. Gurley, president of the Atchison, Topeka, and Santa Fe Railway, yesterday disclosed that individual outlets will be placed in sleeping cars.

Each roomette, bedroom, compartment, and drawing room will be equipped with push-button selector, a loud speaker, and volume control, so that occupants may have their choice of radio or wire-reproduced popular or semi-classical music, Mr. Gurley stated. A pilot lamp, lighting automatically when the announcement system is in use, will be installed so that passengers may turn the system on if they so desire.

As a forerunner of this innovation, wire reproducing units providing programs of various types of music, will be placed on the Santa Fe dining car 1450 when it goes into transcontinental service on March 10. As soon as equipment and labor are available, the railroad president declared, similar installations will be made on both new and old dining cars, as well as sleeping, chair, and club-lounge cars.

Speakers will be placed in the ceiling of these cars to provide an even distribution of low-level sound throughout the car. The volume will be set at an advantageous point for both the listener and conversationalist, it was stated.

Farnsworth Television and Radio Corporation of Fort Wayne, Indiana, designed the over-all integrated system.

Reprinted from the Chicago Journal of Commerce, March 4, 1946.

New Program Distribution Systems Make Rail Travel More Pleasant; Will Increase Passenger Traffic!

Systems Produced by Pioneers in Quality Sound Reproduction, Communications and Television.

Music now brings its magic to the railway passenger — and gives railroads another tool with which to sell travel by rail!

In announcing the first modern electronic program distribution systems for railroads, the Farnsworth Television & Radio Corporation takes a logical step forward. Known for its superlative phonograph-radios, including The Capehart, for its pioneering in the fields of tonal reproduction, television and other forms of electronics, Farnsworth now extends its engineering knowledge and manufacturing skill to the field of passenger entertainment.

These new systems will meet the varying tastes of passengers and the specific operating conditions of individual roads. Based upon the knowledge secured from railroad-conducted surveys, the most complete Farnsworth system provides four channels for individual selection: one for classical and one for popular music; a third for radio programs; and a fourth for train announcements and travel talks. More simplified Farnsworth Systems are also available.

Farnsworth engineering has met and overcome the problems peculiar to pleasing sound reproduction in passenger cars, including the need for uniform, low-level distribution and automatic compensation for varying ambient noise levels.

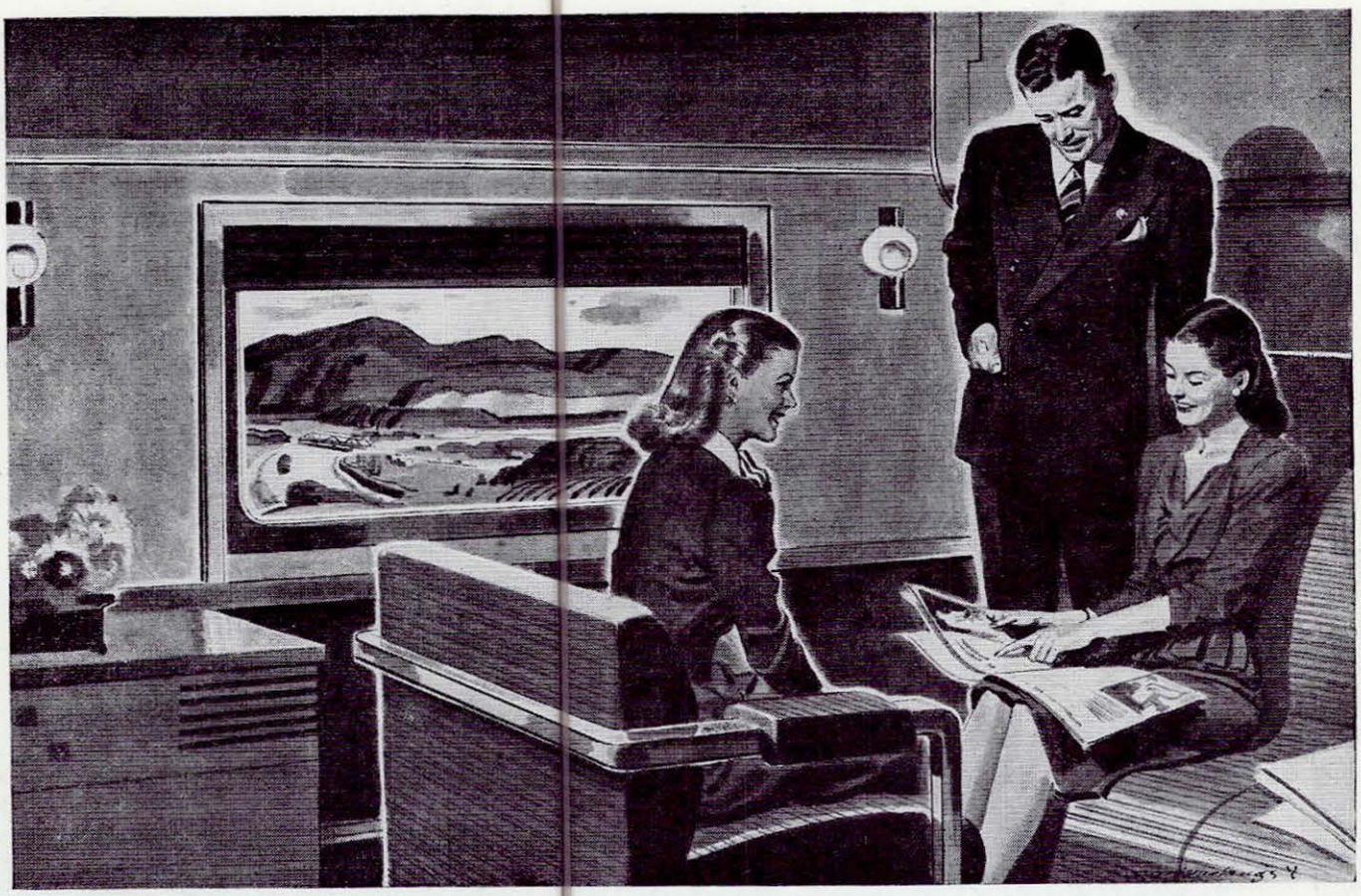
With these comprehensive, flexible systems, railroads can now provide passengers with the same standard of entertainment and comfort they expect in their own homes. Farnsworth Television & Radio Corporation, Fort Wayne 1, Indiana.

Farnsworth

MAKERS OF

THE CAPEHART • THE PANAMUSE BY CAPEHART

Other Products Include: **Farnsworth Radio and Television Receivers and Transmitters • Aircraft Radio Equipment • Farnsworth Television Tubes Halstead Mobile Communications and Traffic Control Systems for Rail and Highway • The Farnsworth Phonograph-Radio**



THANKS TO THE NEW "D-R" V-BELT

A *Spot of Home* RIDES THE RAILS!

Adequate, dependable power for light and for "conditioning" the air in this drawing-room-bed-room car makes any family on the move feel right at home.

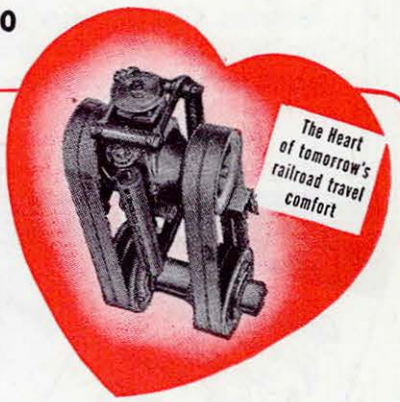
And adequate power is best assured with the use of a vastly improved V-Belt—the new Dayton "D-R" V-Belt on the under car axle drive. This new Dayton "D-R" V-Belt, thanks to war-born research, has stronger fabrics, improved long-life compounds and new construction principles. Yes, it is a far better belt than even the famous "D-R" V-Belt, prewar. This new belt is designed to give well over 150,000 miles of service. Dust, dirt, heat, cold, ice, rain or snow do not affect its performance.

A Dayton Railway Specialist will welcome the opportunity to tell you more about this belt and to consult on its application to your equipment.

THE DAYTON RUBBER MANUFACTURING CO. • DAYTON 1, OHIO

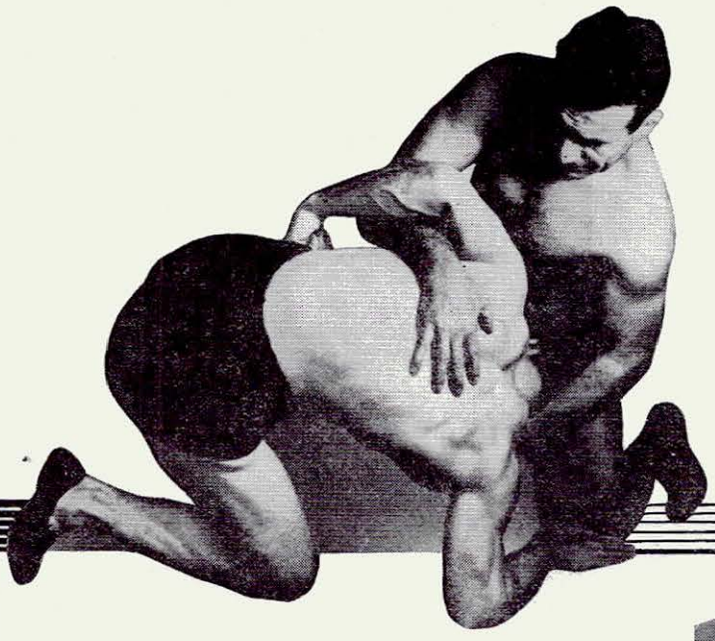
Advantages of the Dayton "D-R" V-Belt Axle Drive

1. Quiet and smooth performance with high availability—in 15 years a mechanical failure due to V-Belts has never been reported.
2. Provides a flexible, cushioned connection between the car axle and the driven unit that protects generators and other equipment should a mechanical failure occur.
3. It is convenient and economical to install . . . no complicated or expensive truck changes are necessary . . . no special axles are necessary.
4. Duplicate equipment is not necessary to take care of emergencies—when wheel changes must be made, only the axle pulleys need to be removed.
5. It greatly reduces maintenance cost on mechanical equipment as well as on the drives.
6. It imposes a minimum weight on the car axle.
7. Easy and simple to install, dependable in operation, and insures uninterrupted performance.

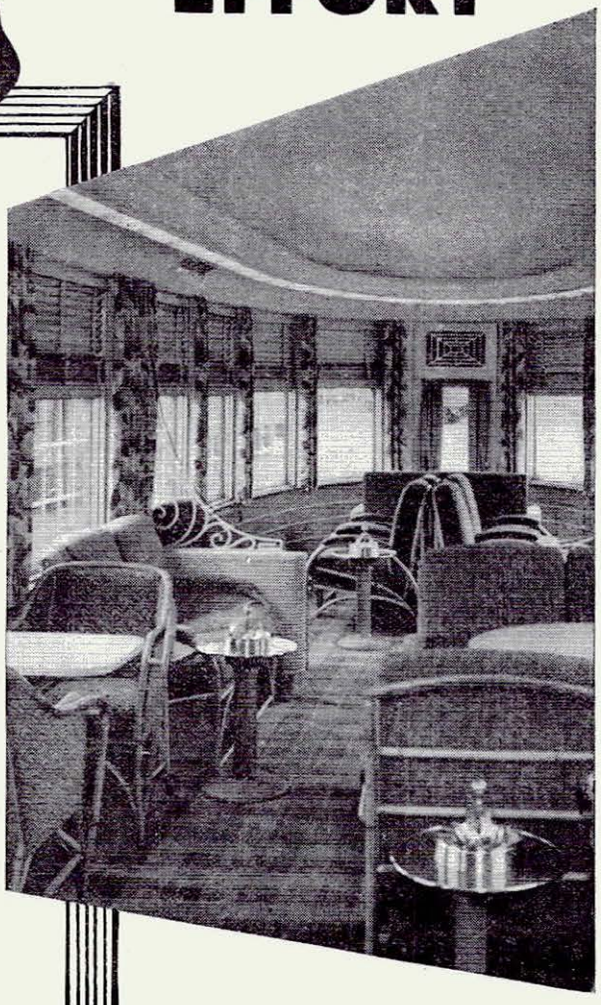


Railroad V-Belts by **Dayton Rubber**

THE MARK OF TECHNICAL EXCELLENCE IN NATURAL AND SYNTHETIC RUBBER



POWER *for* SUSTAINED EFFORT



Gould Kathanode Batteries meet railroad car lighting and air-conditioning demands for their entire service life

Like trained wrestlers, Kathanode batteries have endurance. They deliver 100% or more of rated capacity year after year.

Here's the reason why—

The extra large positive plates of the Kathanode Battery are packed with Black Oxide active material. Made in the Gould plant by an exclusive Gould process, this active material contains particles of pure lead, which, through normal cell action, replace spent active material as needed. Thus the power producing capacity of the battery is maintained.

Black Oxide is but one of Kathanode's special features. Get the facts. Write Dept. 158 for Catalog 800 on Gould Kathanode Batteries for Car-lighting and Air-conditioning Service.

GOULD

LONG LIFE CONSTRUCTION

KATHANODE

GOULD STORAGE BATTERY CORPORATION, Depew, N Y.
Service Centers: Atlanta • Boston • Buffalo • Chicago • Cincinnati
Cleveland • Detroit • Kansas City • Los Angeles • New York
Philadelphia • Pittsburgh • Portland • St. Louis • St. Paul • San Francisco

"For low cost Protection...

...apply FLINTKOTE CAR CEMENT"

Flintkote Car Cements prevent dampness and corrosive acids from attacking the corners, angles, and steel under-frames of your freight cars.

This tough, quick-drying Flintkote asphalt-base compound, specially formulated to meet railroad conditions, also prevents flying cinder and gravel from scratching slope sheets, and laying the metal open to the weather and corrosive fumes. Couplers, metal ends, and end posts, too—in fact any vulnerable metal surfaces—can be quickly protected with Flintkote Car Cements. Available for application with spray-gun, brush, or trowel.

Over forty years of research and successful experience are behind the manufacture of Flintkote Railroad Products. Our technical specialists are ready to cooperate with you in the solution of individual problems. Simply call or write your nearest Flintkote office today.

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Flintkote Specialized Railroad Products include:

Asphalt Protective Coatings . . . Car Cements . . . Insulation Coatings . . . Cold Mastic Flooring . . . Building Materials . . . Waterproofing and Dampproofing Materials.

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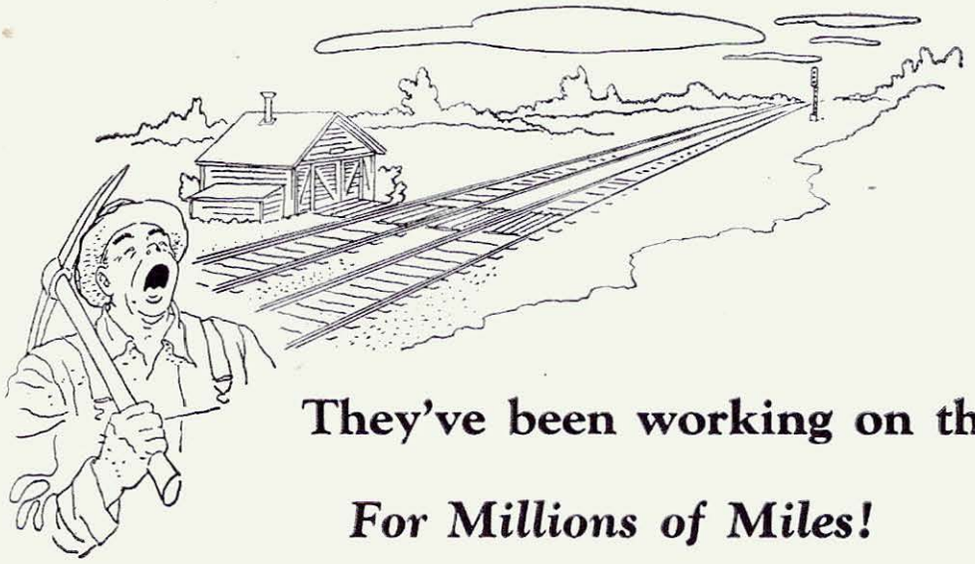


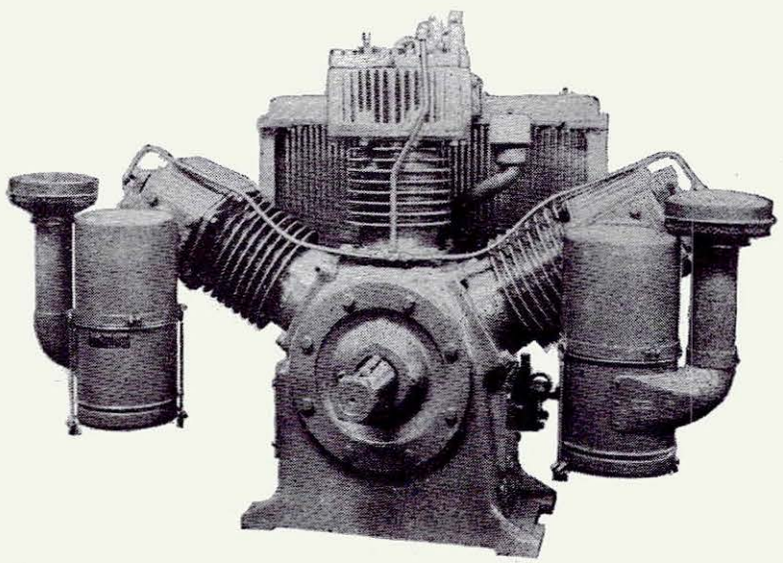
They've been working on the railroad

For Millions of Miles!

These Gardner-Denver WXE Air-Cooled Compressors have proved their reliability, their unfailing performance, in millions of miles of service on Diesel electric locomotives. They've shown their greater worth in signal and switch service. They've demonstrated their economy in shops and power plants.

Small in size, WXE Compressors are built with all the quality of larger machines. Their heavy circumferential cooling fins eliminate cylinder distortion. Their crankshafts are mounted on Timken tapered roller main bearings. Pressure control is accurate and reliable. Air cushioned duo-plate valves prevent air leakage.

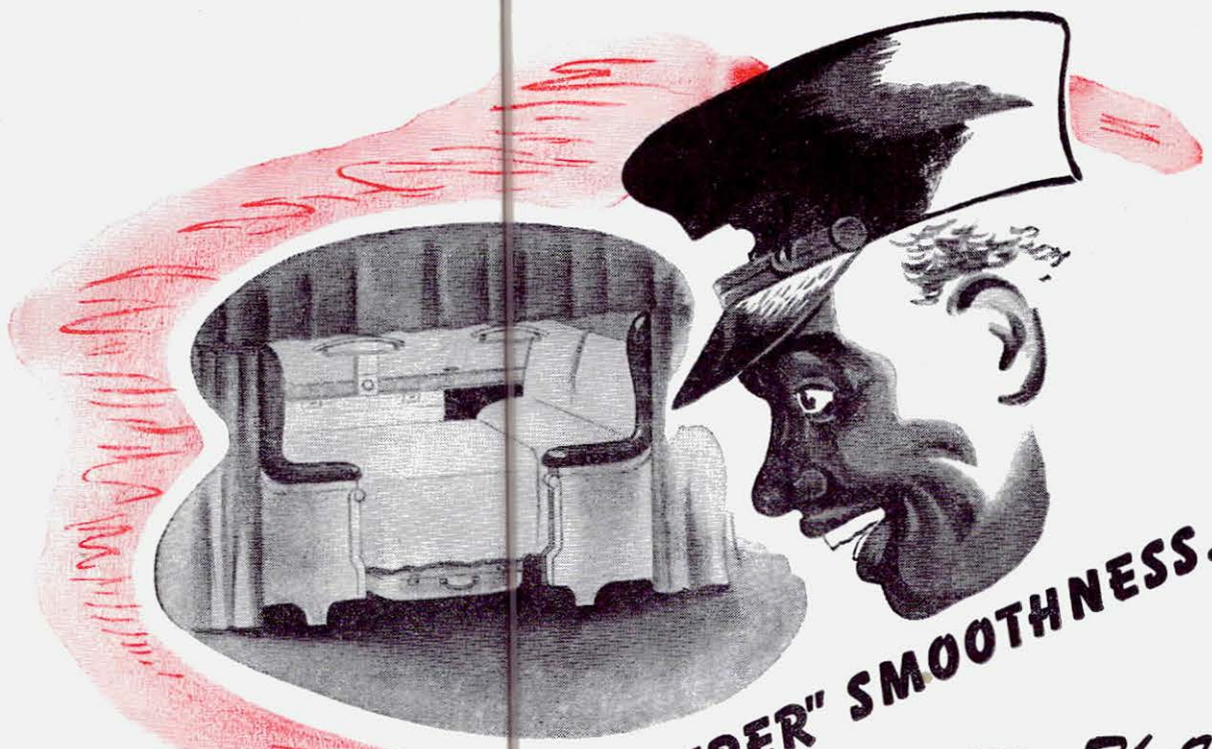
Let us show you why Gardner-Denver WXE Compressors are a better buy for *your* railroad. For full information, write Gardner-Denver Company, Quincy, Illinois.



Gardner-Denver WXE Air-Cooled Compressor

GARDNER-DENVER

Since 1859



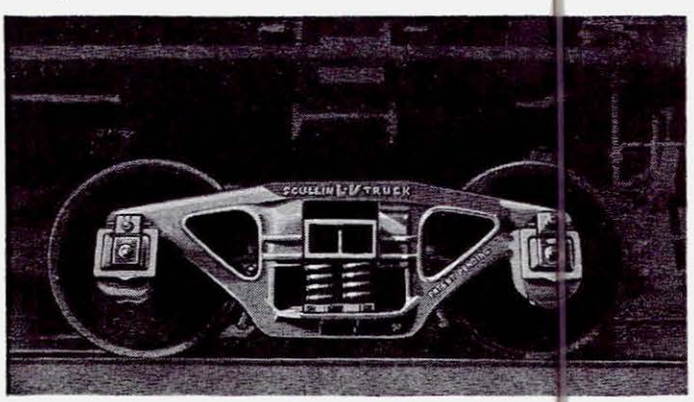
FREIGHT CARS WITH "SLEEPER" SMOOTHNESS...

The New

SCULLIN L-V TRUCK

LATERAL-VERTICAL CUSHIONED MOTION

TAKES THE "SWING AND SWAY" OUT OF YOUR FREIGHT



Designed to make higher speeds really *safe* for lading, cars and roadbed. Completely controls and cushions all lateral and vertical motion—necessary to provide ultimate riding qualities.

• Simple, trouble-free, easy to maintain • Eliminates lateral impacts • Maintains constant controlled truck alignment • Comparable to conventional freight car trucks in both price and weight • For complete details write:

ARMY NAVY

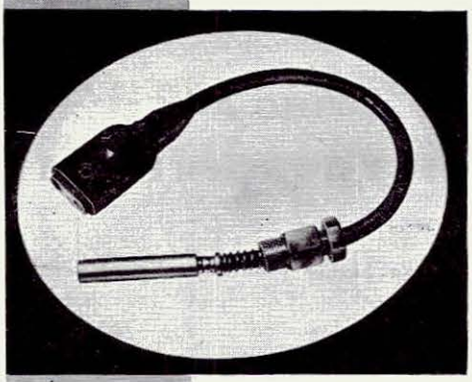
SCULLIN STEEL CO

SAINT LOUIS 10, MISSOURI

STEEL CASTING MANUFACTURERS SINCE 1899

NEW YORK • CHICAGO • PHILADELPHIA • CLEVELAND • ST. PAUL • BALTIMORE • RICHMOND, VA. • MEXICO CITY, D. F.

Greater speed . . . faster schedules . . . "on-time" performance — these factors will maintain railroads in their dominant position in the business of carrying passengers and freight. Increasing train speeds require improved safety measures. No railroad executive can afford to overlook the possibility of having a fine record marred by hot box troubles.



THERMOSWITCH Detector — Critical Unit Of The FENWAL Journal Alarm System

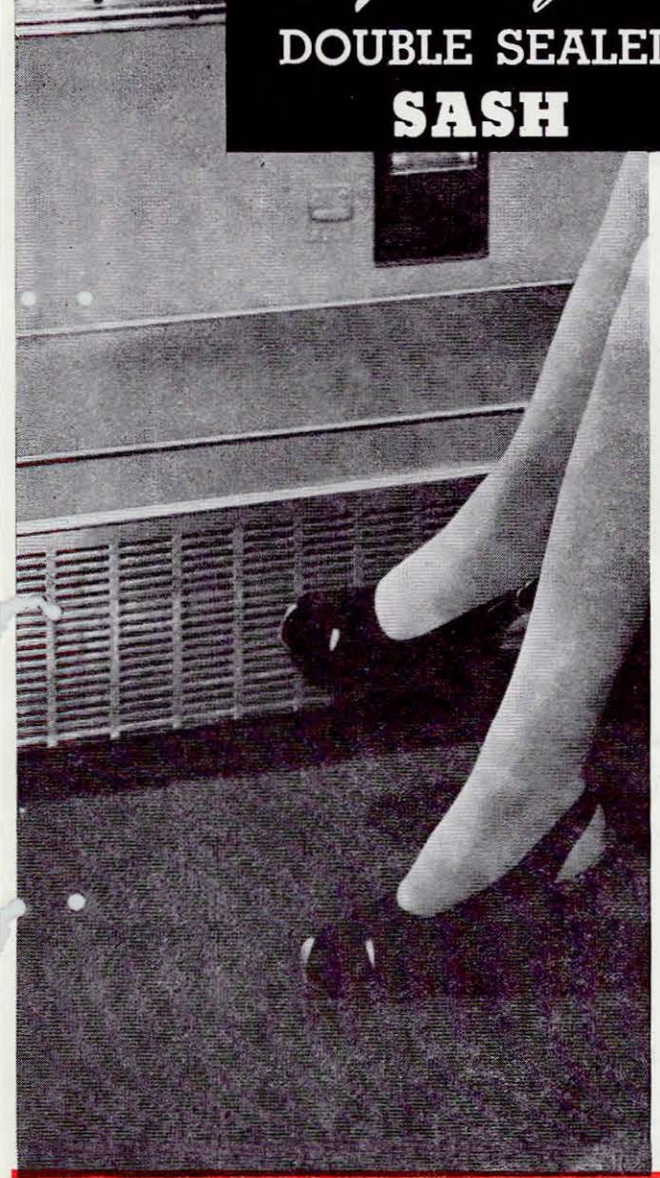
The FENWAL Journal Alarm System detects journal box overheating before serious difficulty develops . . . prevents costly breakdowns and delays. The THERMOSWITCH Detector — critical unit of the FENWAL Journal Alarm System — is located in the journal box close to the outer bearing. If the temperature gets too high, this control activates the alarm system . . . a warning light flashes and a buzzer rings persistently in the car . . . danger and delay are averted.

Your safety record is a positive means of influencing greater passenger travel. *Make* sure *that your safety program is adequate by getting complete information about the FENWAL Journal Alarm System. Write for brochure.*

FENWAL INCORPORATED
ASHLAND, MASSACHUSETTS

WINDOWS OF CONSTANT, BRILLIANT VISIBILITY

Vapor-Tight
DOUBLE SEALED
SASH

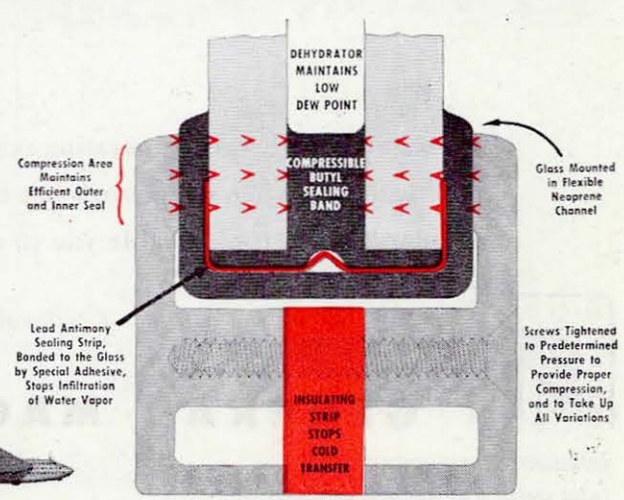


BY EDWARDS

New Vapor-Sealed Dehydrated Sash by Edwards for air conditioned cars in high speed, streamlined trains, is the last word in double glazed sash design. To passengers they bring windows of constant, crystal-clear visibility, regardless of weather, climate or altitude . . . to operators, units that are built to last for the life of the car with the absolute minimum of service.

Before preparing sash specifications for new or renovated equipment, get the facts on the new Edwards Vapor-Sealed Unit. It's the best designed, most ruggedly built, most efficient sash ever offered to the railroads of America—and it's competitively priced!

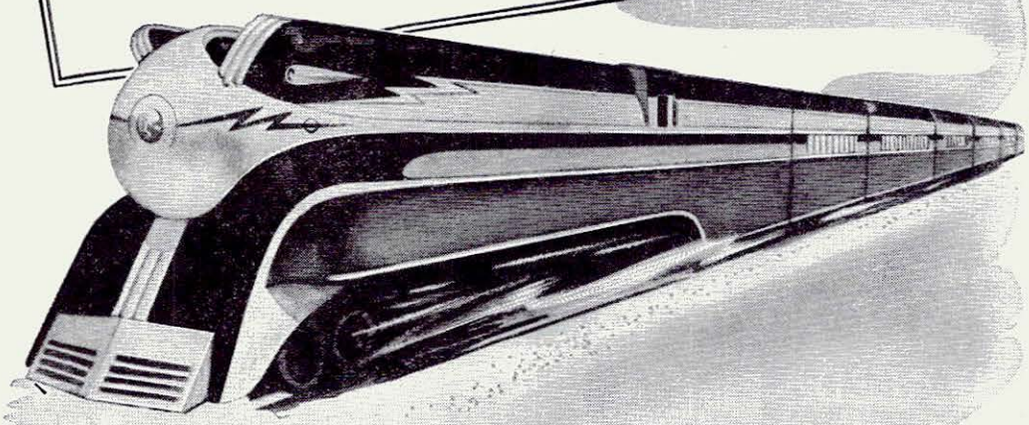
O. M. Edwards Company, Inc., Syracuse, N. Y.


DEHYDRATOR MAINTAINS LOW DEW POINT
Compression Area Maintains Efficient Outer and Inner Seal
COMPRESSIBLE BUTYL SEALING BAND
Glass Mounted in Flexible Neoprene Channel
Lead Antimony Sealing Strip, Bonded to the Glass by Special Adhesive, Stops Infiltration of Water Vapor
INSULATING STRIP STOPS COLD TRANSFER
Screws Tightened to Predetermined Pressure to Provide Proper Compression, and to Take Up All Variations

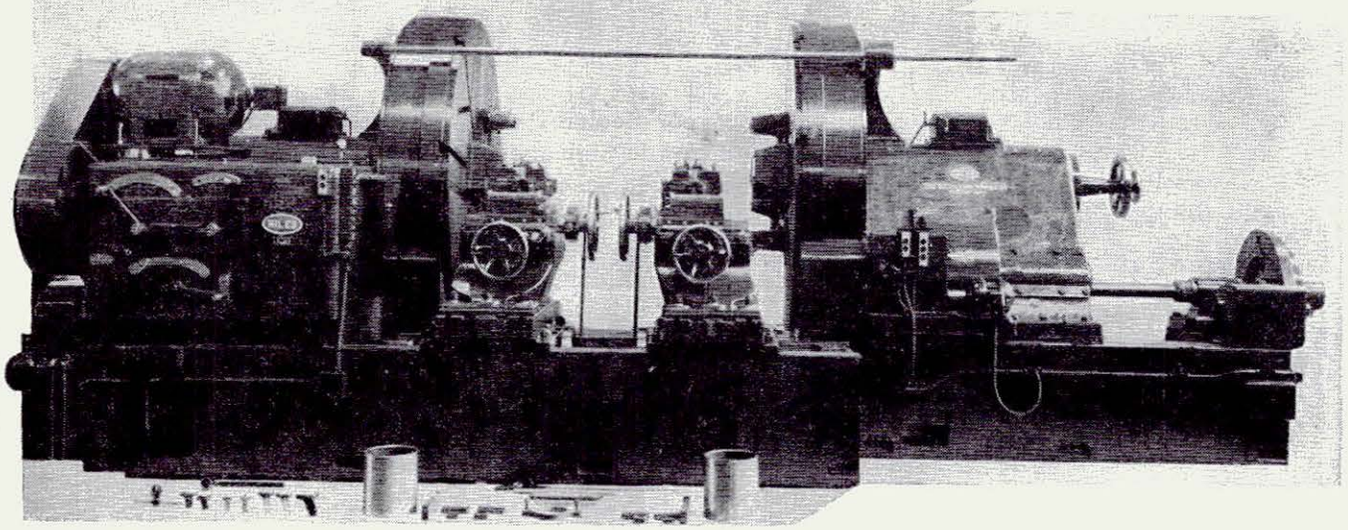
SASH FOR EVERY TYPE OF TRANSPORTATION—ON LAND, ON THE SEAS, IN THE AIR

NILES 90"
HEAVY DRIVING WHEEL LATHE

NILES



★ Over 100 years experience building high quality into a vast quantity of machine tools.



Present-day high-speed operating schedules are possible and practical only when shop work has been held to the highest standard. Niles tools enable you to maintain this standard.

Write for catalog of Niles Railway Tools

Designed for the heaviest tread and flange contour turning duty with modern tool steels. Saves time, saves labor, gives maximum production with accuracies required for high speed locomotive operation.

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REPRESENTED THROUGHOUT LATIN AMERICA BY MACHINE AFFILIATES, INC.

THE NILES TOOL WORKS CO. ★ THE HOOVEN, OWENS, RENTSCHLER CO

Beautiful isn't it? Spectacular and efficient too. And on such great engineering jobs as well as on little spurs throughout the land Improved Hipowers are helping maintain track.

IMPROVED HIPOWERS
IMPROVE TRACK

THE NATIONAL LOCK WASHER COMPANY, NEWARK, 5, N. J., U. S. A.

A COMPLETE LINE OF RAILWAY SPRING WASHERS

now... All-Welded Flat Cars

- FOR GREATER STRENGTH
- FOR WEIGHT REDUCTION
- FOR LONGER LIFE

A completely welded underframe . . . double "I beams" form the "backbone". . . effectively welded to "side sills" providing a framework to withstand the most rugged service.

All-welded construction also provides a weight reduction of 5 tons, for no over-lapping of plates and beams are required as in riveted assembly. Such sturdy construction means longer life for the car itself as well as increased payloads.

This marks another step in the prime objective of a.c.f.—to develop the finest in railroad equipment . . . making cars more useful, safer for ladings and more productive in building railroad revenue.

AMERICAN CAR AND FOUNDRY COMPANY

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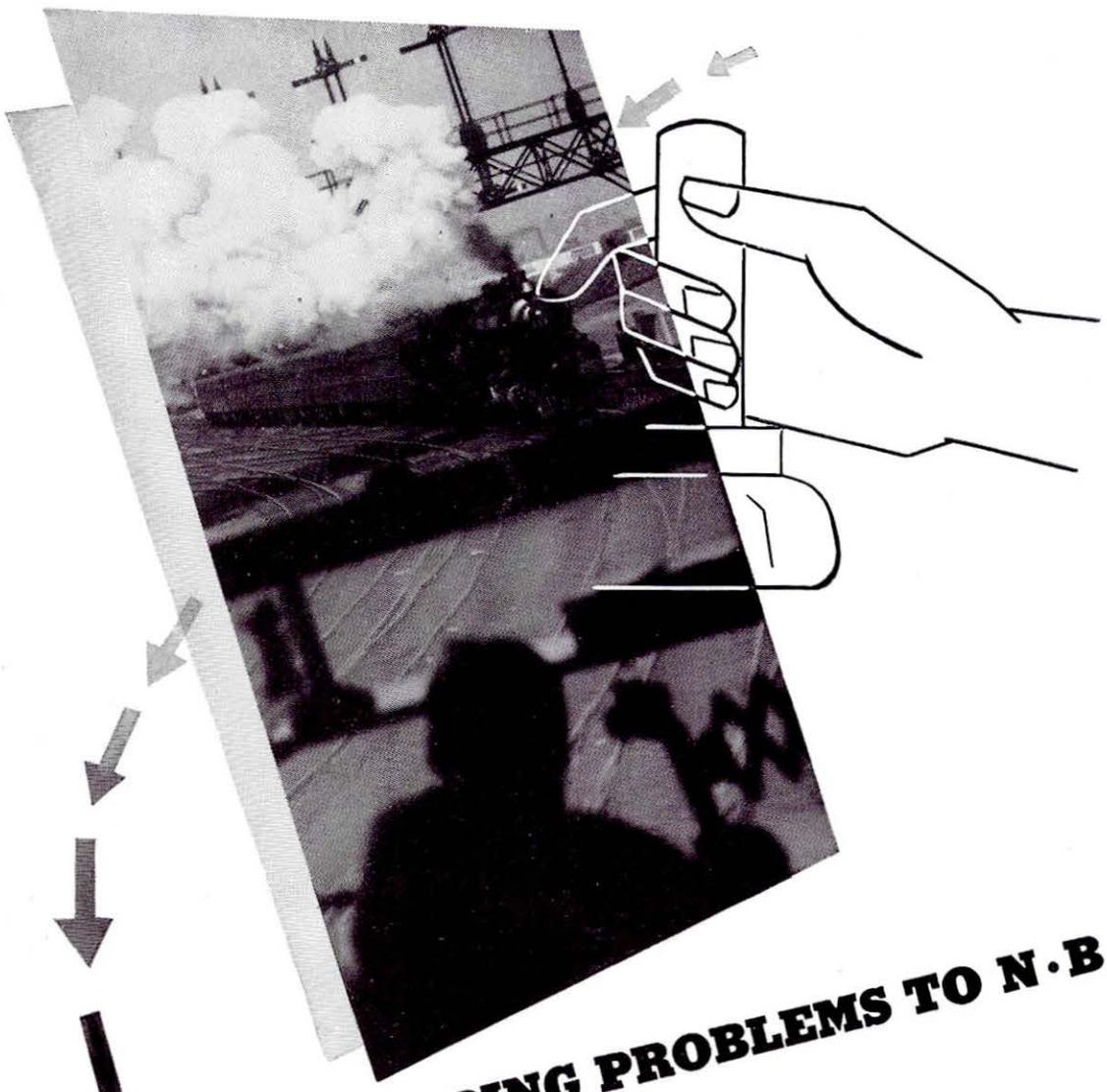
CAR BUILDERS TO AMERICA'S RAILROADS



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Solving railroad bearing problems is our business. N-B-M engineers are constantly working with railroads to improve bearing performance. You'll find their experience helpful.

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Luxury . . . Plus!

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AUTOMATIC

END DOOR OPERATORS

add CONVENIENCE to your new modern trains

CONVENIENCE goes hand in hand with luxury. Think how much more attractive your beautiful new coaches, compartment cars, lounges and diners can be if made easy to reach.

Luxury . . . *plus* is what travelers want. And by equipping your new passenger cars with N. P. automatic end door operators, you graciously satisfy this demand.

End doors, of either the sliding or swinging type, equipped with N. P. automatic operators, are instantly obedient to your passengers' fingertouch. Doors open and close effortlessly and safely. And the action is timed to prevent unnecessary loss of conditioned air.

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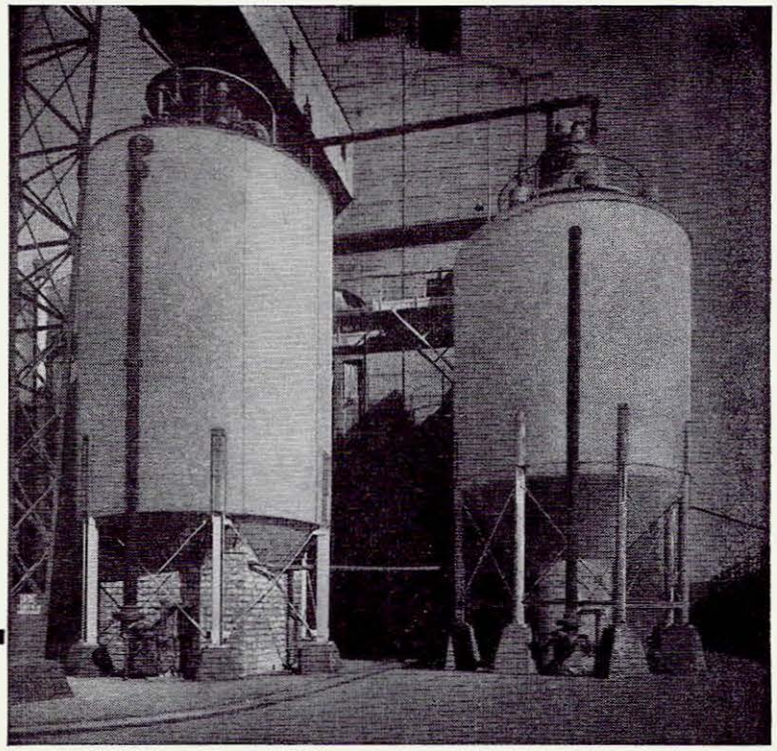
Distributed in Canada by Railway & Power Engineering Corp., Ltd.

WORLD'S LARGEST BUILDER OF DOOR CONTROL EQUIPMENT

FOR MASS TRANSPORTATION VEHICLES

70,000 GPH Phosphate Hot Process Water Softener installed to supply feed water for boilers operating at 1500 psi.



WATER CONDITIONING *Facts* WORTH KNOWING

No. 1 in a series

THE REASONS FOR LIME AND SODA PHOSPHATE TREATMENT

Water produced by the lime and soda softener, hot process type, is softened to approximately one grain per gallon of hardness. This treated water is suitable for use in low pressure boilers as it will not deposit scale in the boilers, but leaves only a sludge which is easily washed out.

However, with boilers operating at high pressure and temperatures the compounds contained in this treated water are converted into scale forming solids, which are damaging to boilers and boiler feed equipment. To eliminate this scaling, secondary treatment with phosphate or phosphoric acid is required to produce water of zero hardness.

GRAVER HOT PROCESS WATER SOFTENER —LIME—SODA-ASH AND PHOSPHATE

This equipment is available as a combination in which the lime and soda softener and the phosphate softener are combined in a single unit. In this system the lower portion of the sedimentation tank is used for the lime and soda softening process. This softened water is then discharged into an upper compartment where the phosphate treatment takes place. From here the water enters the deaerator where the oxygen and free CO_2 gases it contains are removed. The water provided by this system is perfectly conditioned for boiler feed being of zero hardness and free from corrosive gases. The efficiency and economy of operation of this equipment makes it an extremely worthwhile investment.

ALSO AVAILABLE AS TWO SEPARATE UNITS

The Graver Hot Process Softener, Lime, Soda-Ash and Phosphate is also available as two separate units. One is used for the lime and soda processing only. The water from this tank is then delivered to a second sedimentation tank where the water is softened to zero hardness by the addition of phosphate or phosphoric acid. Following this treatment the water is deaerated, then filtered and delivered to the boiler feed pumps.

Graver engineers will gladly work with you on any water conditioning problems you may have without cost or obligation to you. Write, wire or phone for immediate attention.

GRAVER WATER CONDITIONING EQUIPMENT

Process Equipment Division of

GRAVER TANK & MFG. CO., INC.

General Offices: 4809-95 Tod Ave., East Chicago, Ind.

NEW YORK CHICAGO CATASAUQUA, PA. TULSA, OKLA.
PHILADELPHIA PORT ARTHUR, TEX. LOS ANGELES, CAL.
PITTSBURGH

Hot Process Water Softeners • Zeolite Water Softeners • Water Filters • Taste and Odor Removal Filters
Iron Removal Filters • Oil Removal Filters • Chemical Mixing and Proportioning Equipment

Guarding the lives of millions from coast to coast

mars

THE LIGHT THAT COMMANDS
INSTANT ATTENTION

Greater protection of lives

for passengers and train crew

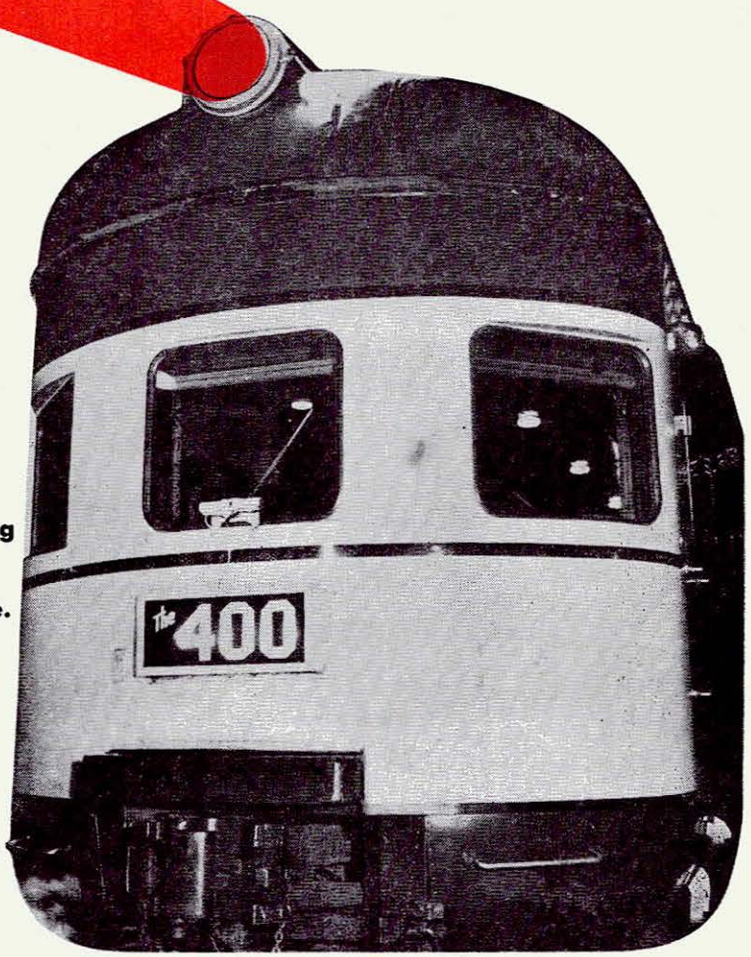
is possible with the MARS red oscillating

signal light for rear-end train service.

Oscillating in a horizontal figure-8 plane,

the strong rays are visible

for great distances both day and night.



Completely automatic, the MARS light goes into action the instant a service or emergency air brake application is made, and remains in operation until manually turned off. In case of danger, its bright red beams provide ample warning to prevent rear-end collisions, or in the event of derailment, sideswiping by trains on other tracks.

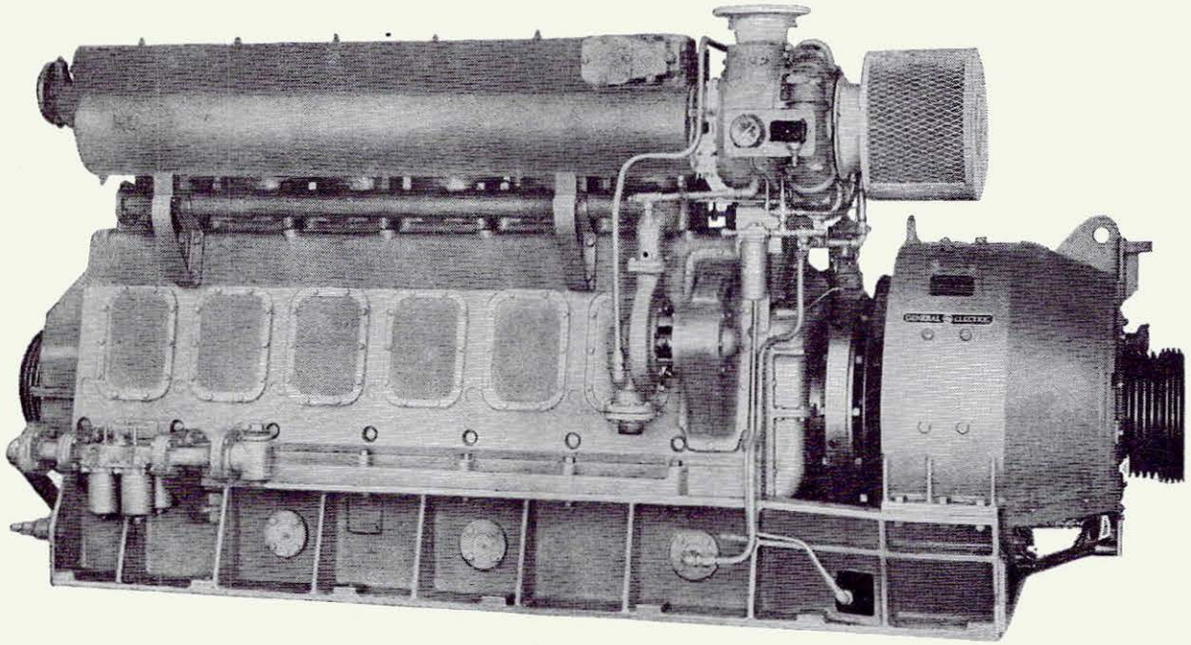
In use by 27 Class I railroads for front and rear end protection.

Write us for complete information and details.

mars SIGNAL LIGHT CO.

5733-41 W. Division St., Chicago 5, Illinois

The HOUDAILLE *Viscous Damper*



Proves its Efficiency on this 660 H. P. Cooper-Bessemer Locomotive Diesel

• When Houdaille* engineers designed a Viscous Torsional Vibration Damper for the new Cooper-Bessemer FW-6-LT Locomotive Diesel, the original damper so completely met Cooper-Bessemer's requirements that it now has been adopted for all production models of this compact locomotive engine.

Other extensive tests of the Houdaille* Viscous Torsional Vibration Damper have proven it equally efficient in reducing both major and minor critical orders of vibration in installations ranging from automobile engines to diesels of 1500 H. P. In relation to the size of the engine, the Houdaille* Damper is remarkably small and compact. And because of its simplicity—there are only two essential parts—it will operate efficiently, without attention or service.

Houdaille* engineers will be glad to discuss the application of the Viscous Torsional Vibration Damper to any internal combustion engine.

An exclusive Development of Houde Engineering Division, Patents Pending

HOUDE ENGINEERING DIVISION OF
HOUDAILLE-HERSHEY CORPORATION
MAKERS OF HYDRAULIC CONTROLS
BUFFALO 11, NEW YORK

*Pronounced—Hoo-dye

There is no substitute for ANEMOSTAT air-diffusers in air-conditioned trains

During the last 25 years, close to one million (1,000,000) ANEMOSTAT draftless air-diffusers have been installed on heating, ventilating, and air-conditioning systems . . .

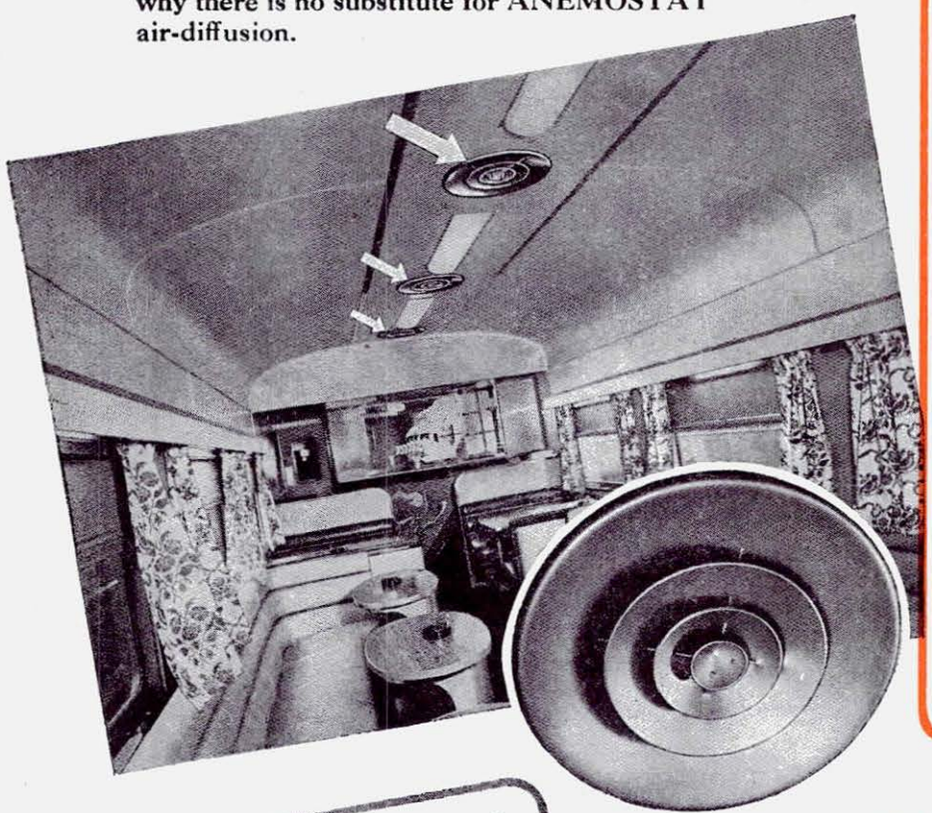
Long and hard-earned experience in installing these patented devices in railroad cars enables ANEMOSTAT engineers to provide constant equalization of temperature—*without drafts*—in air-conditioned trains.

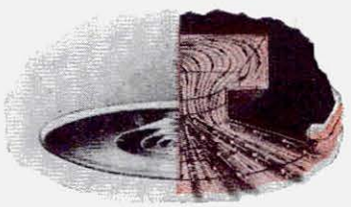
Sleepers, diners, and coaches require individual air-diffusion patterns. Revolutionary changes in the structural design, interior decoration, and equipment of modern trains now make skillfully engineered air-diffuser installations more necessary than ever. And that is why there is no substitute for ANEMOSTAT air-diffusion.

Only an organization devoted exclusively to solving the intricate problems of air-diffusion —as ANEMOSTAT has been doing for over 25 years—can provide air-conditioned railroad cars with close temperature equalization and draft-free air.

ANEMOSTAT air-diffusers are already incorporated in the remodeled and new car designs of many leading railroads.

Write for complete details — today!





WHAT ANEMOSTATS DO TO CONDITIONED CAR-AIR

Due to its patented design, the ANEMOSTAT distributes air of any duct velocity in a multiplicity of planes traveling in all directions. Simultaneously, the unit creates a series of counter-currents which siphon *into the device* car-air equal to about 35% of the volume of supply-air. This car-air is mixed with the supply-air within the diffuser *before* the air-mixture is discharged into the car. The velocity of the discharged air is instantly reduced by air expansion within the ANEMOSTAT.

In this way, the ANEMOSTAT diffuses air of any duct velocity *noiselessly and evenly, thoroughly and draftlessly* throughout the car . . . closely equalizes temperature and humidity . . . and prevents air stratification.

Prompt Deliveries From Stock

We are in a position to make prompt shipments of Anemostats in most standard types and sizes.

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REG. U. S. PAT. OFF.

ANEMOSTAT CORPORATION OF AMERICA

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AC-1049

"NO AIR-CONDITIONING SYSTEM IS BETTER THAN ITS AIR-DISTRIBUTION"

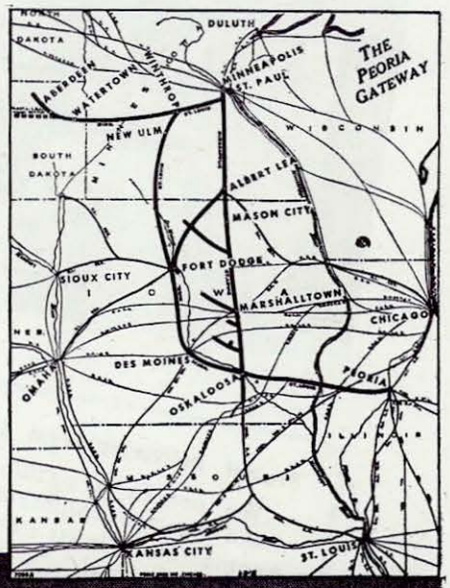
THE MINNEAPOLIS & ST. LOUIS RAILWAY CO.
THE PEORIA GATEWAY

A PICTURE TO REMEMBER

Speeding Freight IN THE GREAT MIDWEST

The Map shows the strategically located lines of The Minneapolis & St. Louis Railway and its Peoria Gateway, which save precious hours in movement of fast freight in the industrial and agricultural empire of the Midwest.

The Picture shows a train that is typical of new equipment the M. & St. L. has added to its car and locomotive fleets during 1945, in a program of modernization begun ten years ago and going on constantly. On this, the Railway already has spent $25,000,000. Newest of the rolling stock includes sixteen Diesel locomotives; a thousand modern steel box cars of 100,000 pounds capacity; ten lightweight aluminum box cars, some of the first ever built; and 150 hopper-type coal cars. This equipment operates on equally modern heavy-duty tracks.



The MINNEAPOLIS & ST. LOUIS *Railway*

GENERAL OFFICES: NORTHWESTERN BANK BUILDING • MINNEAPOLIS 2, MINNESOTA

Top: Shutter operator application to existing manual shutter linkage.
Left: Thermostat application with element in radiator water surge tank.

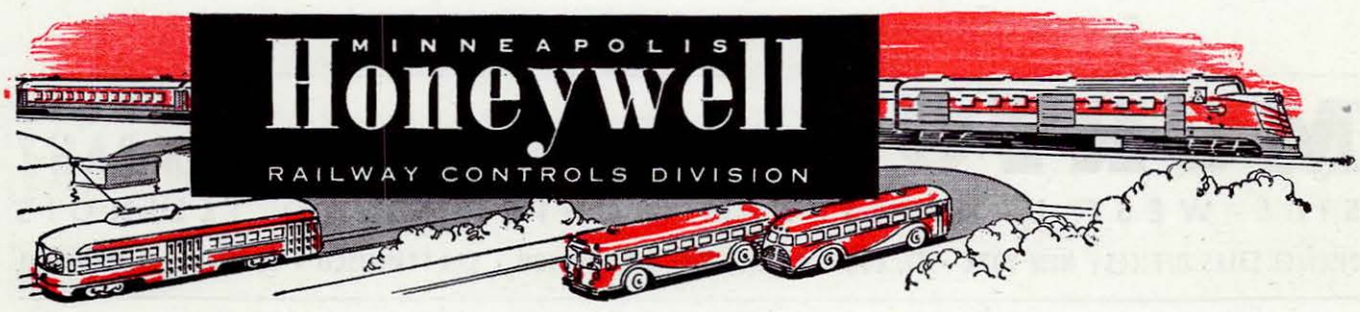
Santa Fe SELECTS HONEYWELL

MODULATING ENGINE TEMPERATURE *Control*

As a result of road tests on a trial installation the Santa Fe—operator of "The World's Largest Fleet of Diesel Drawn Trains"—are equipping 55 of their 5400 H. P. EMD Diesel-Electric freight type locomotives with Honeywell Full Modulating Automatic Engine Temperature Control. This is more and added proof that Honeywell can do the job you want done better.

The installation of the Honeywell pneumatic system on the EMD 5400 H. P. freight type locomotive is easily made and costs are held to a minimum because existing quadrants and manual operating handles are used. Automatic operators are applied so that the means of manual operation of the shutters remains unchanged. Minneapolis-Honeywell Regulator Co., 435 E. Erie St., Chicago 11, Ill.

MINNEAPOLIS
Honeywell
RAILWAY CONTROLS DIVISION



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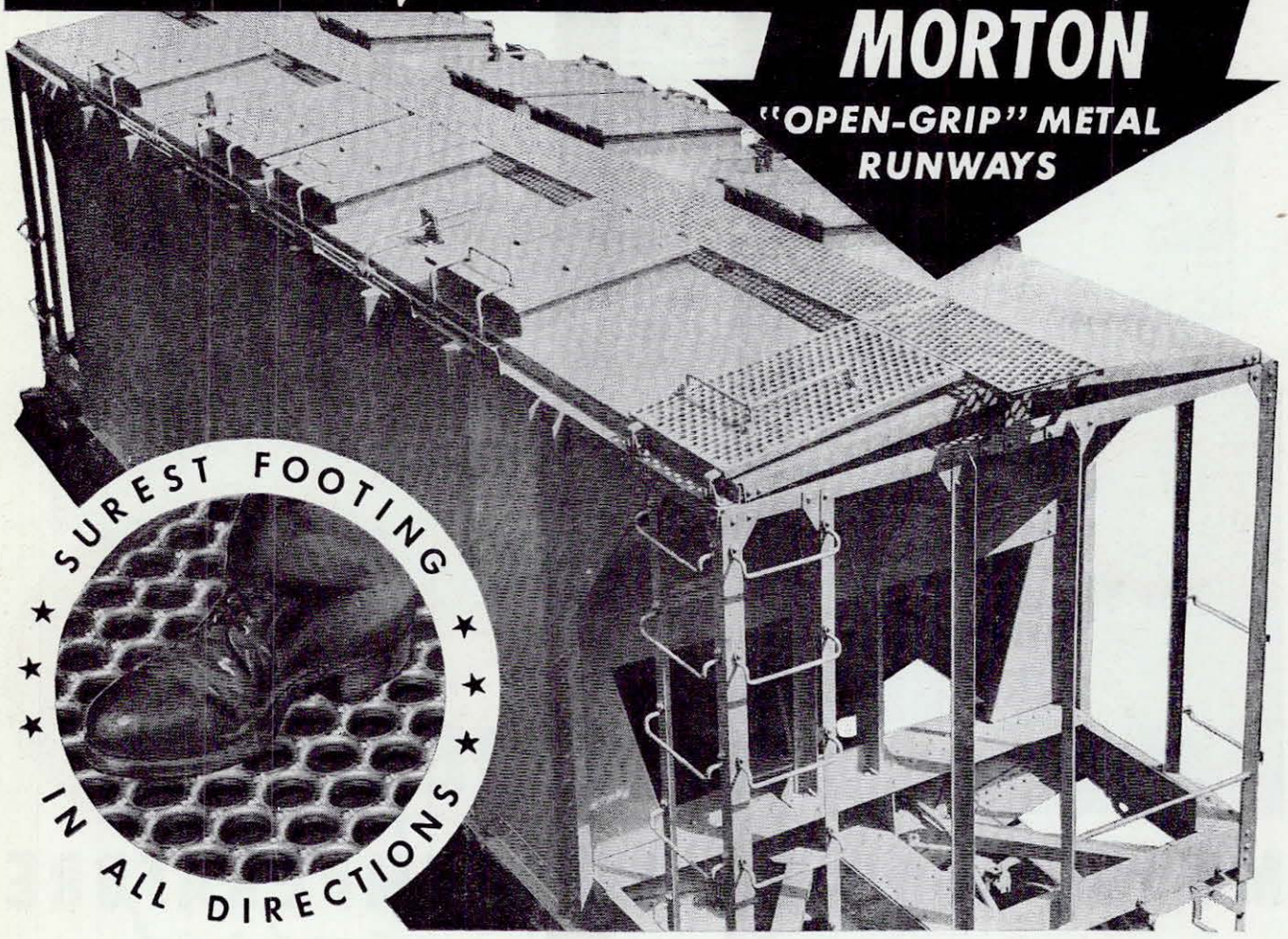
MORTON

"OPEN-GRIP" METAL RUNWAYS



SIMPLIFIED INSTALLATION...LOW-COST MAINTENANCE...SAFEST FOOTING

Morton "Open-Grip" Metal Runways are made of strongest possible construction, as proved by the most rigid service tests. Self-clearing openings prevent collection of ice, snow, mud. Exclusive Kass safety studs provide positive traction—*surest footing*—year 'round.

No special tools, welding or drilling required to install. Nothing to work loose, warp or splinter. Ingenious design avoids precision work and loss of time in fitting. Simple cup-and-bolt device clamps runway into permanent position. Runways are structurally perfected to resist highest torsional strains imposed in service. They're guaranteed to last the lifetime of the car body.

Specify Morton "Open-Grip" Runways and Brake Steps for all types of equipment—for modern all-steel, aluminum or reconditioned equipment. They're thrifty to install. They're thrifty in service. Please write for full information.

"Open-Grip" Runways for Freight Cars • Tank Cars • Stock Cars
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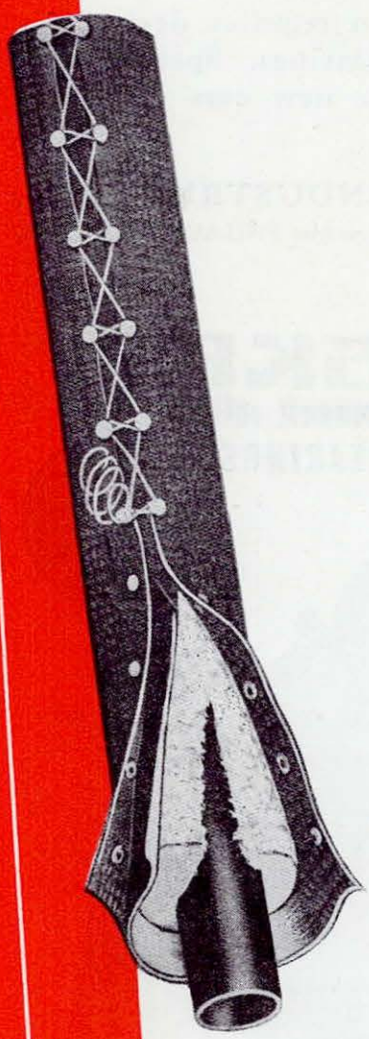

"Since Wovenstone Pipe Covering was first introduced over 15 years ago, most new cars purchased by railroads for regular passenger service have been insulated with Wovenstone. Most roads use it for replacement service too. Little wonder then that Wovenstone is still specified on an overwhelming majority of new cars purchased since the war."

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BEARINGS

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Puts the Right Bearing in the Right Place

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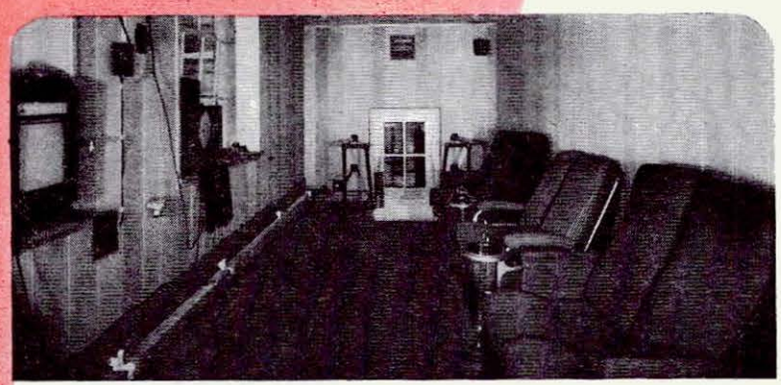
IS DEVOTED TO RESEARCH AND DEVELOPMENT OF ADVANCEMENTS IN HEATING AND TEMPERATURE CONTROL FOR YOUR CARS

VAPOR LABORATORIES



THIS MODEL CAR PROVIDES THE ANSWERS TO QUESTIONS PERTAINING TO COMFORT BEFORE HEATING SYSTEMS ARE INSTALLED

Passenger comfort is of prime consideration in heating and air conditioning controls for all transportation vehicles.

Our continuing development accomplishes this purpose of temperature comfort through the use of products that are simple in construction, practical in maintenance and safe and economical in operation.

The Vapor Car Heating Company is pledged to continue its research and development to provide and make available the latest and best practices in the field of temperature control and heating throughout the transportation industry.

VAPOR CAR HEATING CO., INC.

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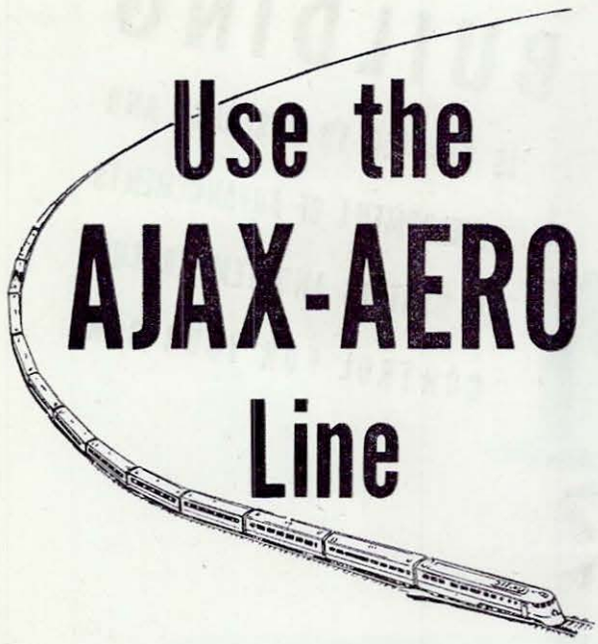

. . . For Passenger Approval

When you specify Ajax or Aero Drinking Cups and Dispensers for passenger cars you can be sure you're providing the best.

Ajax cups are wedge shaped to fit naturally into the contour of the hand. Passengers can hold the cup firmly without having it jump out of the hand — an easy cup to use even while the train is moving.

Aero cups are round two-piece cups with a rolled rim and interlocked bottom. Where a flat bottom or stand-up cup is preferred the Aero is the ideal choice.

Ajax and Aero cups are packed in handy cartons which permit easy and quick loading of dispensers without the drinking edge of the cup being touched.

Passengers will appreciate the clean drinking water service they'll get when they travel with you — and the Ajax-Aero line.

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68 Prescott Street, Worcester 5, Mass.

U. S. ENVELOPE CO., San Francisco Division
416 Second Street, San Francisco 7, California

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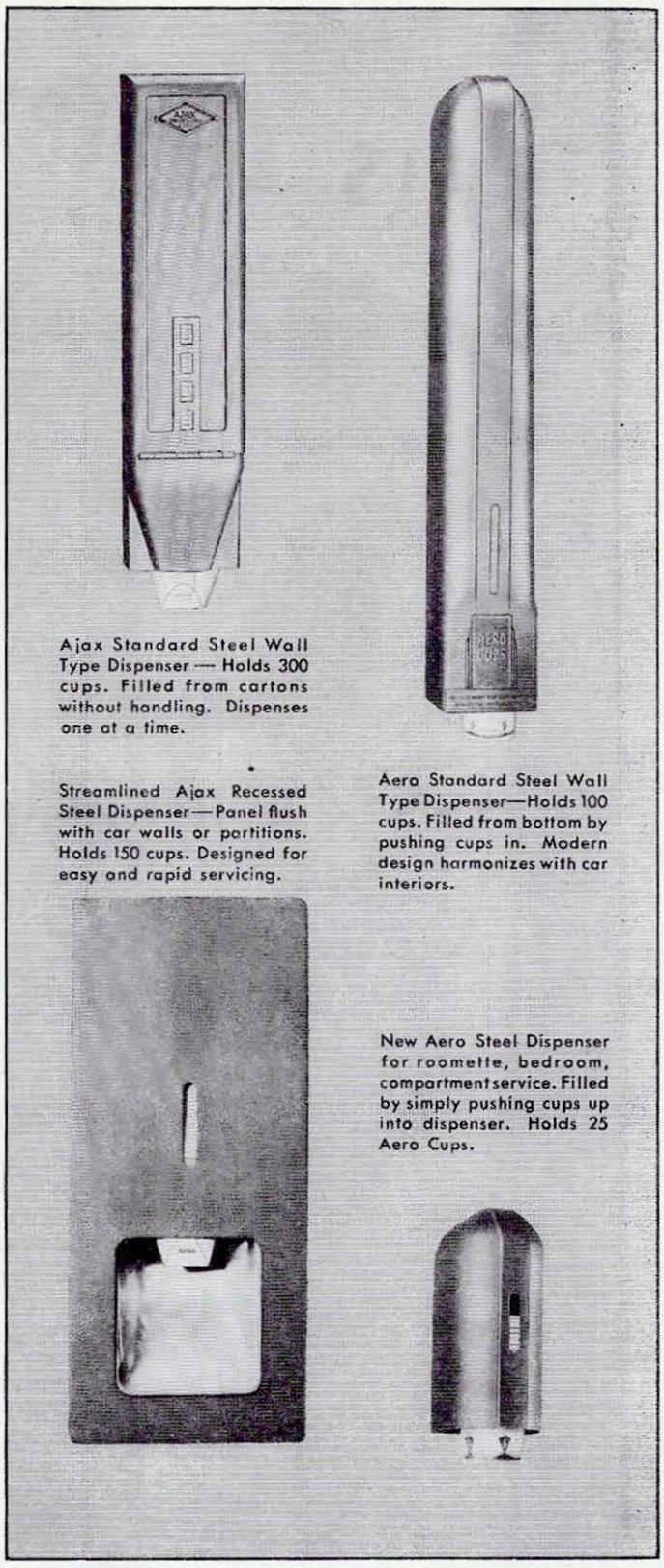
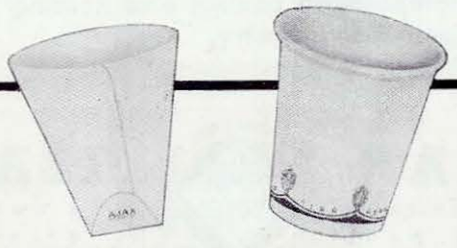


Ajax Standard Steel Wall Type Dispenser — Holds 300 cups. Filled from cartons without handling. Dispenses one at a time.

Aero Standard Steel Wall Type Dispenser—Holds 100 cups. Filled from bottom by pushing cups in. Modern design harmonizes with car interiors.

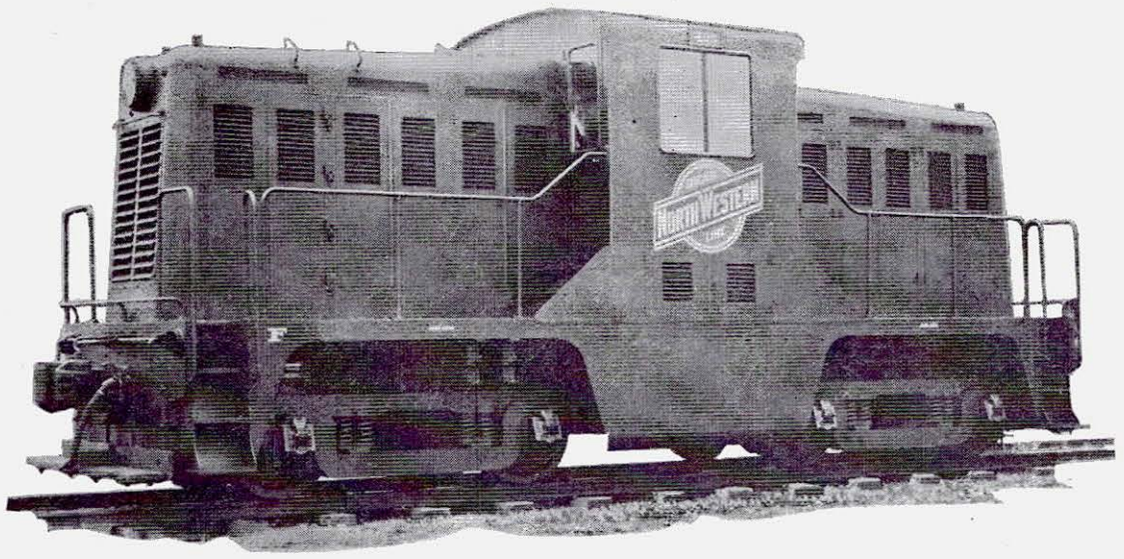
Streamlined Ajax Recessed Steel Dispenser—Panel flush with car walls or partitions. Holds 150 cups. Designed for easy and rapid servicing.

New Aero Steel Dispenser for roomette, bedroom, compartment service. Filled by simply pushing cups up into dispenser. Holds 25 Aero Cups.



AJAX AERO

PAPER DRINKING CUPS



YEARS OF EXPERIENCE ARE BUILT INTO THIS WHITCOMB SWITCHER

Each passing year brings improvements in design, construction or material used in Whitcomb locomotives. Suggestions from a user may lead to better visibility or a more convenient arrangement of controls and less fatigue for the operator—a new metal is born—if it meets our requirements more accurately it is immediately designed into the next job. Constantly our Engineering and Research Departments are striving to produce locomotives that will move more tons, in less time at lower costs per mile.

Typical of the results from these far reaching policies is the 44 ton Diesel Electric illustrated. Pound for pound—there is more locomotive built into this Whitcomb Switcher than in many others, without the Whitcomb name plate, that are tons heavier. Ask about its remarkable tractive effort performance in speed ranges up to 35 miles per hour.

Other Diesel Electrics for Railway service to 95 tons.

BLW THE BALDWIN GROUP

THE WHITCOMB LOCOMOTIVE CO.

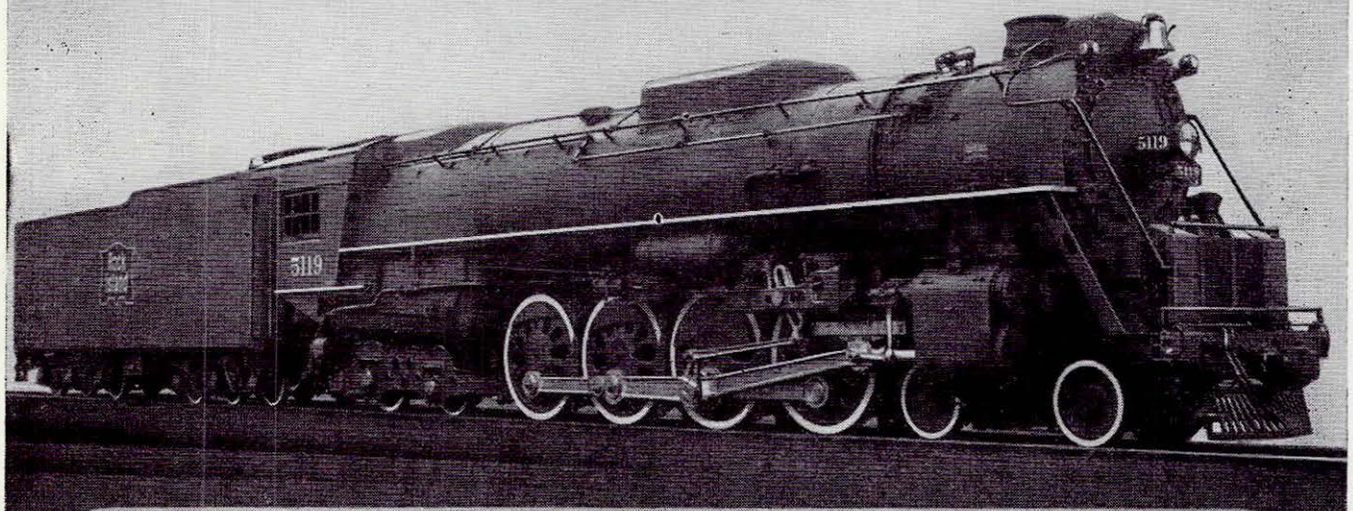
ROCHELLE, ILL.

Subsidiary of THE BALDWIN LOCOMOTIVE WORKS

STANDARD STOKERS

Always Dependable For

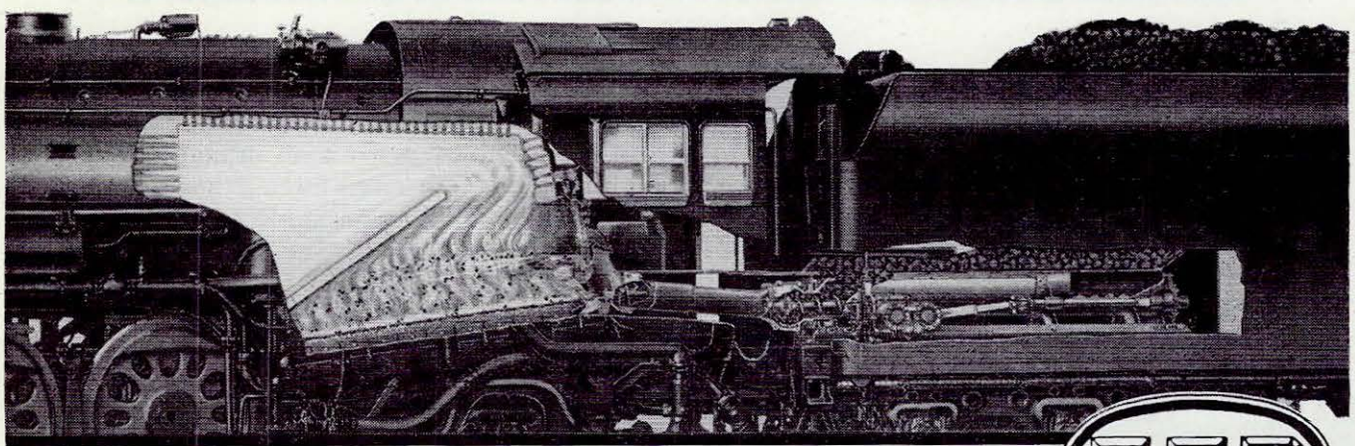
NEW POWER • MODERNIZED POWER • EXISTING POWER



10 MORE ROCK ISLAND 4 - 8 - 4'S EQUIPPED WITH STANDARD B K STOKERS.

Transportation Service in 14 states with 8000 miles of modern railroad demands the utmost in modern mechanical firing for new steam power . . . Standard B K Stokers are firing the Rock Island's new 4-8-4's . . . contributing essentially to their maximum output under all service conditions.

METHOD OF FIRING WITH A STANDARD BK STOKER



THE STANDARD STOKER COMPANY, INC

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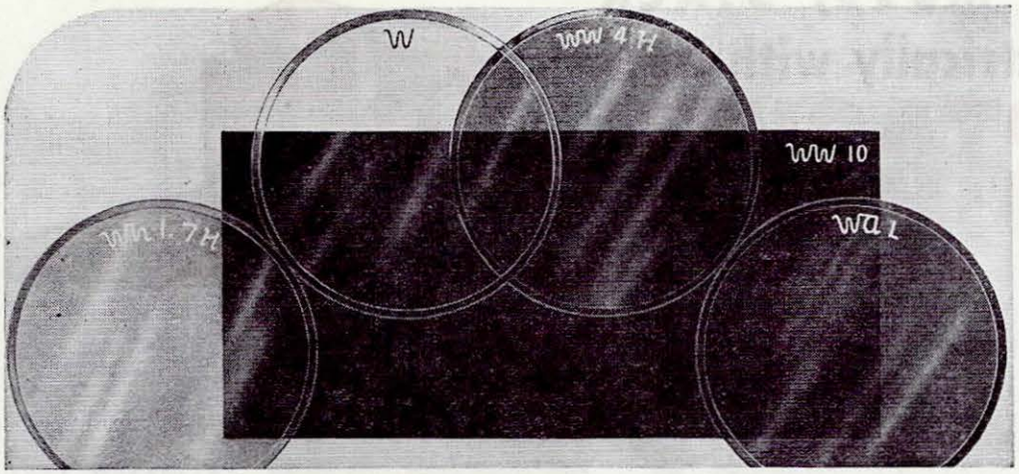
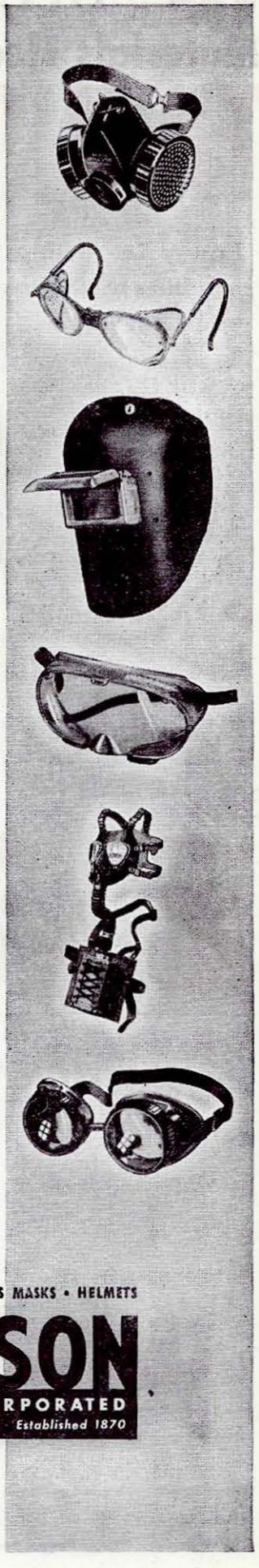


WILLSON SAFETY GLASS
Gives Assurance Of Reliable Eye Protection



You can't determine the quality of safety glass by merely looking at it—for most glass looks about the same except for shade. The way to be sure of proper eye protection for your workers is to select clearly marked glass of a dependable manufacturer. Look for these identifying Willson trademarks. They represent 75 years of safety experience and are your assurance that every Willson lens meets most rigid Federal specifications for optical quality.

CLEAR SUPER-TOUGH* GLASS For operations where flying particles (but not glare) endanger the eyes. Each Super-Tough* lens must pass the Federal drop-ball test for impact resistance, the Polariscope test for uniformity of heat treatment.

W

WILLSON-WELD* GLASS For all types of welding, wherever high temperatures and excessive glare are encountered. Green glass in eight shades, accurately graded for density and thickness, filters out harmful ultra-violet and infra-red rays.

WW

WILLSON-WELD SUPER-TOUGH GLASS For double protection, against both glare and flying particles, on all types of welding operations.

WW H

WILLSONITE* SUPER-TOUGH GLASS Particularly useful in the vicinity of welding operations. Furnishes both glare protection and impact resistance. Willsonite green permits objects to be seen in their natural colors—an extra safety feature.

WH H

WILLSON ALUBRO-WELD* GLASS A special blue welding glass to protect eyes during aluminum or bronze welding where a sodium yellow glare is encountered. Available in three shades—light, medium and dark.

WA

Let us make a survey of your particular safety needs—at no obligation on your part. For detailed information on the Willson Safety Service Program write to theRailroadSalesDept., WillsonProducts, Inc. 241 Washington St., Reading, Pa.

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Now! LIFT, MOVE, STACK Materials Electrically with NEW

TRANSTACKER

PRICED AT ONLY $1800 (Some Models Slightly Higher)

Low price brings modern material handling methods within reach of all!

NOW for the first time every business—every industry can use modern, money-saving material handling methods at new low cost.

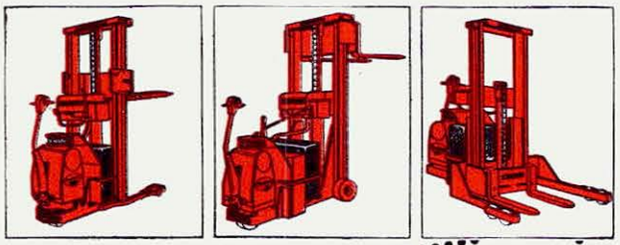
Because in the new Transtacker, Automatic's engineers have developed a high-lift stacker that sells for as low as $1800. And while it will move, lift and stack up to 4000 pounds, it weighs only 1900 pounds. This means you can safely use Transtacker, even if your floor and elevator capacities are limited.

With all the advantages of the famed Transporter that moves any kind of material with amazing "touch-of-your-thumb" ease, Transtacker now gives you an electric hydraulic lift that stacks your product at new heights to increase storage capacity. With finger-tip control it lifts up to 4000 pound loads in a matter of seconds . . . smooth, controlled lowering speed for utmost safety. Mail coupon for facts.

OPEN FACE PALLET TYPE TRANSTACKER—Capacity 3000 pounds—With suitable forks for stacking open face pallet loads.

SUSPENDED LOAD TYPE PALLET TRANSTACKER—Capacity 2500 pounds—With suitable forks for stacking double or open face pallets.

STRADDLE TYPE PALLET TRANSTACKER—Capacity 4000 pounds—With suitable forks for stacking double face or open face pallet loads.



PLATFORM TYPE TRANSTACKER

Capacity 4000 pounds

For stacking unit loads on skid platforms.

Above price applies in U. S. only

PRE-TESTED IN INDUSTRY

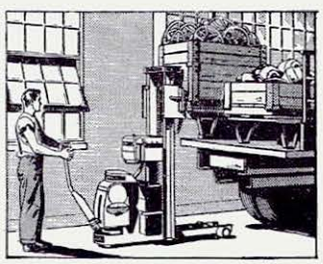
1. Cuts loading and unloading time in half.
2. One man does the work of three with less effort—Transtacker cuts handling costs up to 60%.
3. Light in weight for limited floor and elevator load capacity.
4. Hauls any kind of product with "touch-of-thumb" ease.
5. Gives you extra storage space without added cost.
6. Lifts and stacks product from ground level to trucks and trailers.

LOOK TO THE LEADER FOR ALL THAT'S NEW!

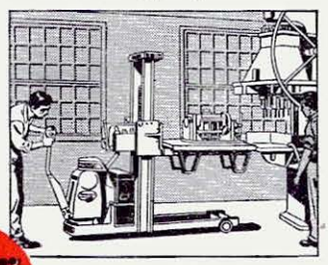
Transtacker
A PRODUCT OF AUTOMATIC

Lightens LIFE'S LOADS

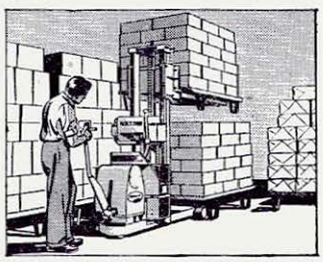
FINGER TIP CONTROLS LOAD
Cartons, crated goods, hard-to-handle material—one man or girl hauls, lifts and stacks to full storage heights.



ENORMOUS SAVINGS IN SHIPPING
Pick up merchandise from ground level and deposit it on truck or trailer. A three-man operation becomes a one-man operation.



LIFTS HEAVY MACHINE PARTS
When heavy machine parts must be lifted to working height, let Transtacker safely lift it and place it.



ENDS BACK-BREAKING HANDLING
This can be *your* trucker—easily, efficiently stacking your material with Transtacker. Extra storage space is yours free.

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Please mail me without cost or obligation, complete facts about the NEW TRANSTACKER.

( ) Have an A.T.C. Specialist call and survey my material handling costs.

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By..... *Position*.....

Street Address.....

City..... *State*.....

Railway Age

With which are incorporated the Railway Review, the Railway Gazette, and the Railway Age-Gazette. Name registered in U. S. Patent Office.

Vol. 121 August 17, 1946 No. 7

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The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service.

★

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consider *maintenance* when you select a train communication system

IF train communication equipment is to become a part of your railroad's operating facilities, make sure it meets standards for ease of maintenance comparable to those by which you select other pieces of important equipment.

"Union" Inductive Train Communication equipment is built by men who know the service requirements of train-carried electronic equipment. First of all, it is ruggedly built—every component designed and constructed to reduce maintenance to a very minimum. Then, components are arranged in housings so that they are weather-proof, shock-proof, and vibration-proof to further reduce maintenance and assure dependable service. Electronic equipment is carried in unit assemblies, mounted upon separate trays. Those trays can be easily handled by one man. Plug-in connectors assure positive and correct electrical connections; and speed removal and replacement of units when necessary for routine inspection. Each tray is locked in place upon replacement—connections cannot work loose. Wiring within the bases of the trays is plainly coded for ease of checking.

Shorter schedules, "on-time" performance, and greater availability of rolling stock, all depend upon minimum delays for maintenance of equipment, and upon complete facility of maintenance when necessary. Be sure your train communication system will carry its share of that responsibility —Specify "Union" Inductive Train Communication!

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"UNION" I.T.C. THE VOICE OF EXPERIENCE IN TRAIN COMMUNICATIONS

The Week at a Glance

LOADINGS ESTIMATES CLOSE: The regional shippers' boards, as a whole, came within 0.2 per cent of forecasting exactly what the first quarter's loadings were going to be—such is the disclosure, reported in our news pages, of a tabulation by Warren Kendall, chairman of the Car Service Division, A. A. R. Predictions by individual boards were less near the mark—one of them being almost 20 per cent off; and, by commodities, some of the errors in estimate were very large, i.e., as high as 50 per cent. But the forecasts which were wrong were those where strikes hit with unusual force—and nobody can forecast economic behavior with any assurance where a large admixture of politics is injected.

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POLITICS AND FORECASTS: It is this involvement of politics which throws so much uncertainty into the future of the transportation business. Take the railroads' rivals, for instance. Nobody can foretell with any assurance how much traffic they can take from the railroads because there is no way of even guessing how much assistance politics is going to give them at the taxpayers' expense. If they were self-supporting, as the railroads are, and private capital had to be raised to pay for all waterways and superhighways, then a man with a sharp eye and pencil could make figures to tell him with some confidence what railroad traffic might be ten years hence. It is the uncertainty which political expenditures on transportation inject into the estimates of private investors—as much as the competition of the publicly owned facilities—which makes these outlays of public funds so discouraging to private investment in the same industry.

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WHEELER BILL VETOED: President Truman has vetoed S. 1253, the so-called Wheeler-Reed bill, which provided means of reorganizing railroads without bankruptcy proceedings, and which would have extended this privilege to some railroads already in bankruptcy. Mr. Truman did not object to the purposes of the bill, but complained that it did not go far enough in correcting some of the abuses prevalent under the existing law—especially the continued payment of higher interest rates by bankrupt roads than the level obtained by railroads which have avoided financial difficulties.

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THE REAL ISSUE: As readers of this paper recall, the lower house of Congress passed the so-called Hobbs Bill a couple of times—a measure which would have forbidden "freezing out" equity interests in reorganizations where actual earnings indicated that there was value in the equities. This paper supported such legislation—as a necessity, in view of the "hard-boiled" attitude of the I. C. C., to give investors in equities the assurance that they would not be arbitrarily expropriated. Equities condemned to death by the I. C. C. had meantime declined almost to zero and rumor, whether true or not, persisted that many of these securities had passed from the hands of bona fide investors into those of speculators who would stand to make fantastic gains if the proposed legislation had become a law. It is a much more complex problem to remedy the results of economic folly and injustice than it would have been to have avoided it in the first place.

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SATURDAY UNLOADING: O. D. T. Director J. Monroe Johnson wants receivers of coal to have help on the job on Saturdays to unload coal, instead of delaying these cars on their return trip to the mines while the shippers' employees enjoy a weekly holiday. He also asks shippers to unload these cars during free time, without running into demurrage. Because of the mine strike last spring, coal movement is being compressed into 10 months of the year, and unless the cars are used more effectively, there may be a lot of greatly needed coal which won't be delivered.

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AGE OF PULLMANS: D. A. Crawford, president of Pullman, Inc., in a circular letter to stockholders, has commented on recent criticisms by the C. & O. of the alleged antiquity of Pullman equipment. Pullman's cars, Mr. Crawford says, average 5 years less in age than the railroads' own passenger equipment. Modern cars are supplied on busy routes and the older cars are used as a "standby reserve" and to provide service on lines with insufficient traffic to sustain the cost of newer cars—in all an appropriate use for old cars which "is a real economy and a public benefit."

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LET'S HOPE SO: The I. C. C.'s Bureau of Statistics in its "Monthly Comment," reviewed in our news pages, suggests that revenues and expenses of the railroads for the first half of 1946 may be "appreciably less than half" of the totals for the full year.

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CHICAGO CONVENTIONS: The important meetings of the Mechanical and P. & S. Divisions in Chicago last week are reported elsewhere in this issue. The work of the Divisions is reviewed in editorials which credit these organizations with a large contribution to the railroads' successful handling of their war job—and proceed to the conclusion that activity of this kind is quite as necessary in meeting the new problems which peacetime has brought as it was while hostilities were in progress.

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PROFITLESS AIR MAIL: Congress has reduced the domestic air mail rate from 8 cents an ounce to 5 cents, on a showing of 1944 figures that air mail in that year cost the Post Office a little less than 5 cents an ounce to handle. The leading editorial in this issue points out, however, that in 1944 a large proportion of air mail (possibly up to 40 per cent) was actually handled by train. If it had all moved by plane the cost would have been more than 5 cents, as was indicated in recent testimony by P. J. Schardt, assistant vice-president of the Southern.

NO TRAINS FOR DEFENSE?: The excuse for operating air mail service in the red or close to it—thus diverting mail revenue from the railroads—is to foster aviation in the interest of national defense. But billions are already being spent to foster aviation, by direct appropriations to the military air service and for the development of airports, the provision of traffic direction and weather services and research—so why introduce contra-economic principles into the Post Office just to slip the plane business a few more millions of tax money? Our editorial contends that adequate railroads are as necessary militarily as an aviation industry, and the railroads have no source of public funds to keep them going. Deny them the traffic to which they have a legitimate economic claim and they have nothing to live upon.

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KATY TO GO ALL-DIESEL: The Missouri-Kansas-Texas expects to rely on Diesel-electric locomotives exclusively for its motive power, just as soon as it can get enough of the new engines to replace its steam ones—such was the announcement this week by D. V. Fraser, president of the road.

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BUDD HONORED: One of the many pleasant events which came about last week in Chicago was a meeting of the railroad division of the American Society of Mechanical Engineers at which honorary membership in the society—an award infrequently made—was bestowed upon Burlington President Ralph Budd. The principal speaker of the occasion was this paper's editor, whose address was reported in our last week's issue.

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FRISCO LINE CHANGES: The Frisco has improved two serious grades on its single-track main line in Central Missouri, the projects being described in an illustrated article in these pages. Known as Dixon and Hancock hills, the first of these impediments to speed and economy had a maximum grade of 2.3 per cent, with many curves of more than 10 deg., while the second presented a maximum grade of 1.75 per cent with curvature up to 7 deg. These grades limited tonnage to 1,250 westward and 2,000 eastward with the road's biggest engines. The relocations—totaling a little over 12 miles of very heavy work—have greatly reduced curvature and smoothed down the precipitous grades to 1.27 per cent westward and 0.8 per cent eastward, moving maximum train tonnage up to 2,175 westbound and 3,425 eastbound. Five helper engines have been pulled off the Dixon hill and two off of the Hancock grade.

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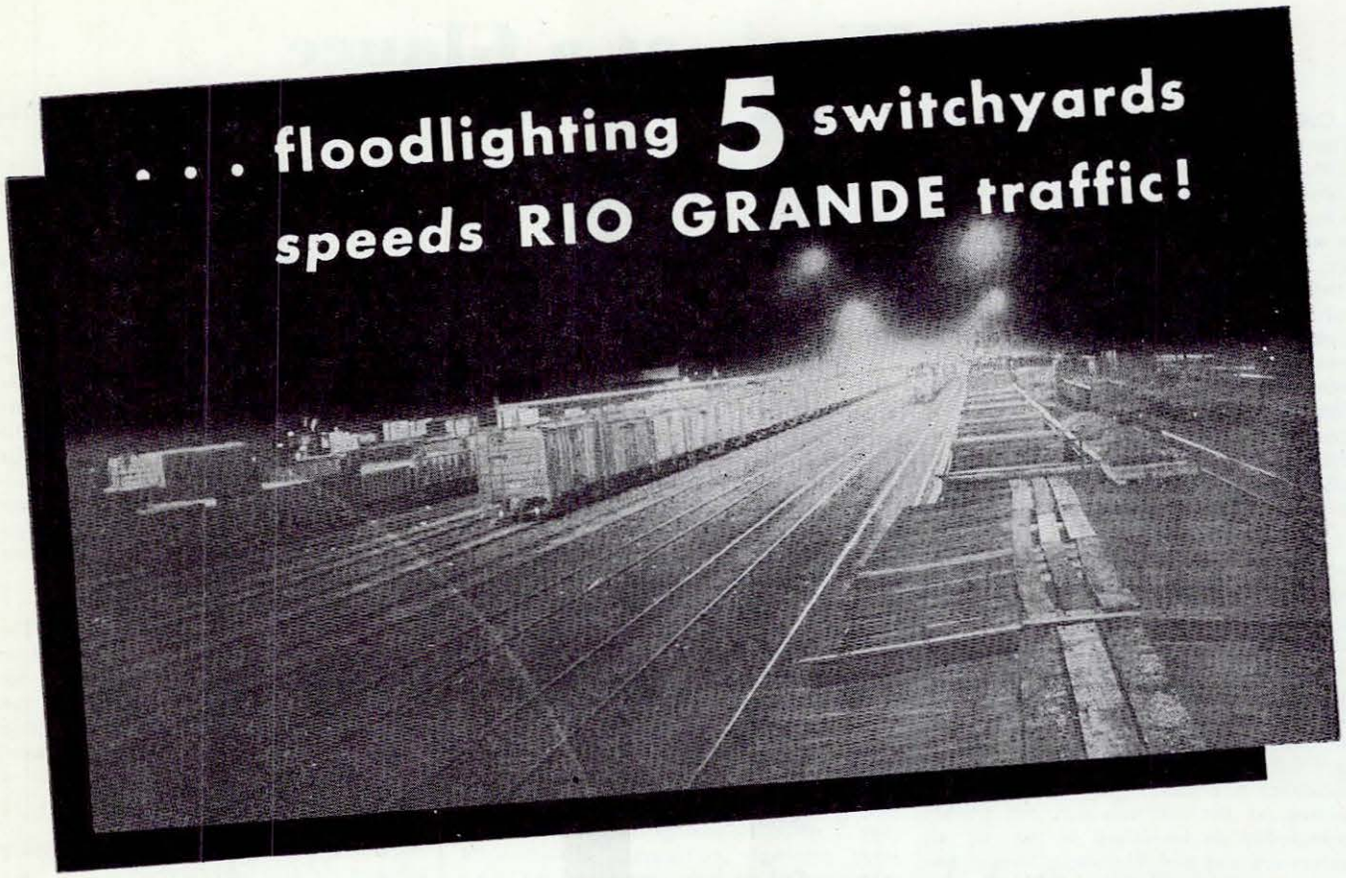
MR. YOUNG SPEAKS AGAIN: Chairman R. R. Young of the C. & O., in announcing that that road and its affiliates intend replacing all their present passenger equipment, characterizes the railroads' policy regarding passenger cars as one of "the public be jammed." He believes real travel promotion by the railroads might bring need for 100,000 new passenger cars.



• With transformers atop towers . . . Okonite-engineered high voltage power cables rising from underground to supply the electricity . . . 1500-watt floodlights strategically located, the Denver and Rio Grande Western Railroad has turned night into day by recent installations at five of its key switchyards. As a result, its workmen locate cars more easily, read bills on cars, get trains made up faster and on their way sooner. Fewer accidents, less pilfering have resulted. 35 towers are now in use.

and OKONITE-ENGINEERED *cables serve underground and in risers . . .*

In thirty-five of these Rio Grande towers, the electric supply reaches them through 2400-volt or 6600-volt Okonite-engineered cables. The service was unusually demanding calling for cable to be buried in ground at foot of towers, then supported on them in the vertical rise. High voltage is carried right to the tower and stepped down at the tower with transformer. (An underslung transformer platform puts primary and secondary voltages at different levels.)

The 2-conductor cables which were specially assembled for this job were designed with Okoloy-coated conductors, moisture-resistant Okolite insulation, sealed within a jacket of non-flammable Okoprene — assembled and wrapped with a durable finish which included 2 layers of hard-twisted jute. Engineers on railroads interested in the advantages of high voltage power supply are invited to discuss their cable needs with Okonite engineers along with their needs for such railroad standbys as signal wires and cables. The Okonite Company, Passaic, New Jersey.

OKONITE OKONITE SINCE 1878

insulated wires and cables

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RAILWAY AGE

Air Mail Versus Railway Mail

Although the postal service is government-operated, it is just as much a public utility as are telephones and electric power; and patrons of the postal monopoly have as great a right to demand that its service be conducted economically as have patrons of the power companies or the railroads to insist on similar economy. When such a utility engages in wasteful practices, its customers suffer the consequences, either through higher prices or poorer service or both, because there is no competitor to whom they may divert their patronage. There is persuasive evidence indicating that, in its decision to reduce the domestic air-mail rate from 8 cents to 5 cents an ounce, the postal authorities have disregarded considerations of economy, and will thereby incur losses which will result in postal deficits to be met by taxation. Either that, or, if the postal service as a whole is operated at a profit, then other classes of mail will have to pay excessive charges to make up the deficits incurred in handling air mail.

In drawing attention to this situation, no disparagement of air mail service is intended. For long hauls, air mail is faster than train mail—especially when the weather is favorable—and the provision of such superior service by the Post Office is not only justifiable but is its definite duty. The fact must also be faced, however, that the superiority of air mail service for the long hauls is available only at a definite and substantial increase in cost over other means of moving the mail—and there is no justice or adherence to economic principles in shifting any part of such increased cost from the users of air mail, either to the overburdened taxpayers or to the patrons of other classes of the postal service.

Costs Far Exceed Rail Movement

In 1944, the latest year for which figures are available, the Post Office Department handled slightly more than one billion pieces of air mail, totaling 34.3 million lb., and paid the airlines $28.5 million for this movement. In the same year 20.5 billion pieces of non-local first-class mail were moved by rail—403.9 million lb.—and the Post Office paid the railroads $21 million for this movement. The railroads, that is, moved *more than twenty times as much* letter mail as the airlines did and were paid 25 per cent *less* for the service. Per piece, it cost the Post Office approximately 26 times as much to transport mail by air as it did to transport it, first class, by rail. Per pound, the cost to the Post Office was 5 cents for letter mail by rail and 83 cents by air—or more than 16 times as much.

No Sorting en Route

Nor do these figures by any means tell the whole story of the immensely superior economy of rail over air transportation—because, for the payments the railroads receive, they provide facilities for sorting mail en route, and transport free of charge the postal clerks who do the sorting. This service is not afforded on planes, and, if it were, the cost of air mail would be far higher than it is now. Railway mail arrives at terminal cities already sorted, thereby reducing the delay incident to actual delivery of mail to addressees—which to a considerable degree offsets the inferior speed of railroad movement.

The Post Office's figures of handling costs per piece—not only transportation but sorting and delivery costs as well—were as follows for the year ended March 31, 1944:

Air mail—domestic	cents	First class	cents
Revenue	6.79	Revenue	2.79
Expense	4.64	Expense	1.80

On the basis of these figures the air mail rate is to be reduced to 5 cents an ounce. The figures would provide equal justification for reducing first-class, rail-hauled mail to 2 cents an ounce, but this reduction has not been made. These figures on air mail costs are, moreover, open to serious question. In testifying before the Senate Post Office Committee on July 12, the chairman of the railroads' committee on mail transportation, P. J. Schardt, assistant vice-president of the Southern Railway, pointed out that in the year ended March, 1944, *a large percentage of mail for which the Post Office collected the air-mail rate was actually moved by train*, because of the shortage of planes. The ratio of air mail moved by the far-more-economical railroads ran around 40 per cent in New York and Washington and between 33 and 40 per cent in Chicago. If all of this mail, for which the Post Office collected an average of 6.79 cents per piece for air movement, had

actually moved by air, the cost figure of 4.64 cents per piece would have been largely exceeded, and, quite likely, would have put air mail service definitely "in the red," as it was in every year prior to 1944.

There exists a considerable political sentiment—skilfully nourished by the airlines—that air mail should be promoted for non-economic reasons, e. g., to provide a strong air transport industry as an adjunct to national defense, and to aid business by affording it more rapid postal service. As for the latter argument, if speedier mail service is worth what it costs, then those who want such service can afford to pay these costs in full and still be better off than if they saved these costs and were denied the service. The "national defense" argument might be a valid one, if the American people were not already paying out billions in other ways to promote aviation development. They are meeting the expense of huge direct appropriations for the Army and Navy air forces, and the large costs of government-financed aviation research—all of it money well spent, because adequate air defense is practically as necessary to life today as food to eat and air to breathe. But the taxpayers are not allowed to pay for air defense entirely by the forthright and honest method of direct appropriations to the armed service. In addition, they must, perforce, also pay another contribution by way of hundreds of millions of dollars for the development of civilian airports; and, to top it all off, are now asked for some further millions by the avenue of an air mail service which is to be operated either in the red or nearly so.

The fact is that war cannot be waged without railroads any more than it can be waged without planes. Indeed, planes cannot even be built in any quantity in the absence of an efficient system of nation-wide railroads. If the government is distributing its transportation business around where it will do the most good in contributing to the national defense, the railroads would have quite as valid a claim to such "support" as the aviation industry. The railroads have not, however, asked for special favors—but only that traffic be not arbitrarily taken away from them when they have the strongest economic claim to it—and diverted to some politically favored agency which is already receiving taxpayers' aid in other ways.

No Earnings, No Railroads

The railroads proved their indispensability during the war, but now, a year after hostilities have ceased, find themselves with government-fixed rates and wages which have denied them any profit at all for a full half year. Congress has just voted large authorizations for highways, waterways and airports—intended to deprive the railroads of peace-time business and injure still further their chances of profitable operation. Now along comes this air mail promotion scheme further to "relieve" the railroads of peace-time traffic and net earnings. Since the railroads depend entirely upon private capital for funds to improve and maintain their services, how can the public and the government look forward to an adequate supply of transportation at the next time of crisis, in the light of the rich and ingenious variety of effective expedients now being relentlessly pursued to drive profit, and hence capital, as far away as possible from investment in railroad facilities?

Labor Day Pass Restrictions

Because of the war the Coordinated Mechanical Associations—the Car Department Officers' Association, Locomotive Maintenance Officers' Association, Master Boiler Makers' Association, and Railway Fuel and Traveling Engineers' Association—have not held member meetings since 1941. In spite of the great difficulties involved, however, their officers and committees have continued to function, and each year these four associations have published creditable reports which have proved a distinct help and inspiration at a time when they were gravely needed.

These associations will hold conventions in Chicago this fall. The only time that hotel and exhibit space is available is in the week following Labor Day, a time when holiday travel is heavy. Many railroads have restrictions on the granting of passes to employees over that period. It is reported that some of them, recognizing the value of the work of these associations to the railroads, have decided to lift these restrictions so far as they apply to attendance at these meetings. Time is short and it is hoped that the other roads will decide promptly to do likewise. At most it will affect only a few hundred men in the supervisory group, who will come separately from widely scattered sections of the country.

The importance of these associations has been recognized by many leaders and railroad executives. As an illustration, when they could not hold meetings last year, Col. J. Monroe Johnson, director of the O. D. T., sent them a message in which he pointed out that competition of other forms of transportation will be greatly intensified because of wartime developments. "This means," said the Colonel, "continued exercise of that ingenuity you of the Mechanical Associations displayed during the war. And many of you have learned new ways of doing things that will make for better railroading in days to come. You will be joined by railroad workers who have been acquiring valuable experience in the emergencies of war railroading in strange and far-off lands and under the most trying experiences."

At the same time President Fred G. Gurley of the Santa Fe closed an appraisal of the work of these groups with this statement: "Based on past accomplishments and future possibilities, the Coordinated Mechanical Associations deserve not only the general approval, but the active encouragement, support and help of railway managements."

Free transportation to attend such meetings as these should not be considered in the category of providing facilities for travel for pleasure or recreation, but, rather, solely for business purposes in the interests of more efficient and economical railway operation.

Counsellors which be learned do proceed upon more safe and substantial principles than counsellors which are only men of experience; the one sort keeping dangers far off, whereas the other discover them not till they come near hand, and then trust to the agility of their wit to ward or avoid them.—BACON.

A. A. R. Mechanical Division Meets Challenge

For the first time since 1941, the Association of American Railroads, Mechanical Division, held an annual member meeting at Chicago last week, reported elsewhere in this issue. The attendance was large and representative; the addresses by three distinguished railway men stimulating; and the vast fund of information and decisions presented in 13 committee reports covering practically every phase of mechanical equipment will have a profound effect upon railway operation during the next year, and afterwards.

Probably no officer or friend of the Mechanical Division would claim that it does a hundred per cent job, or even that its organization is ideal, since so much of the committee work, especially, has to be done by railway officers owing first loyalty to their own individual roads and confronted, particularly in the last few years, with the most exacting problems and ever-increasing demands on their time and nervous energy. The record of the railroads in successfully handling record traffic during the recent war years is well known, however, and the Mechanical Division, in conjunction with other divisions of the A. A. R., played a most important role in helping individual roads work together and achieve operating results hitherto considered impossible.

A number of the committee reports presented this year included a brief summary of work done since the last annual meeting in 1941 and memory is certainly stirred by this "briefing of the record." In the first place, the General Committee has held 18 meetings since 1941 to develop plans, assign work, make decisions and carry on the business of the division. Space is not available here even to mention the outstanding achievements of all the other committees which frequently had to work together in solving joint problems.

In general, it may be said that, without the effective efforts of the Mechanical Division in campaigning for more satisfactory cars placed for loading; safer methods of loading war materials; heavier loading of all cars; expeditious handling of oil tank cars; reduction of hot boxes and train delays; substitution of available materials in locomotive and car construction; emergency and victory car designs; more reliable wheel and axle service; improved locomotive counter-balancing for high-speed service; and other research projects, too many to enumerate, the war efforts of this country would have been greatly retarded if not blocked.

But the statement may be made that all this is past history! The fact is that the need for an aggressive and progressive Mechanical Division of the A. A. R. is at least as great now as in the war years. Still confronted with the heaviest peace-time traffic in history, a shortage of modern equipment, reduced net earnings, scarcity of some materials, increased labor cost, absenteeism, lowered morale, and unwillingness of some shippers to co-operate as they formerly did, all railroad officers, including those in the A. A. R. Mechanical Division, will need to exercise their utmost good judgment, ingenuity and co-operative efforts in maintaining equipment conditions at the necessary level of efficiency and effectiveness in the period immediately ahead.

The report of one committee of long standing is conspicuous by its absence. That is the Committee on Locomotive Utilization. It is true that reports on that subject in recent years had perhaps become too statistical and uninspiringly factual as to mileage performance to effect any major change in the trend of events related to this subject. But considering the limited extent to which known means of intensification of utilization of locomotives and of economy in motive power performance have been put into effect, it seems much too early to discontinue organized work on this subject, even though it has been on the docket for the past 20 years.

More Headaches For Procurement Officers

The value of association work was never realized more fully by purchasing and stores officers than during World War II. The addition of many new and inadequately trained workers, the necessity of applying ingenuity and administrative ability to overcome the handicaps imposed by shortages of manpower, material and equipment, made it necessary that the work of the Purchasing and Stores Division of the Association of American Railroads be carried on as a clearing house on up-to-date information and practices, as well as to give inspiration to the members.

In view of the curtailment of many of the association activities during the war it was most gratifying to both officers and members of the P. & S. Division to witness such a large attendance—450—as that registered last week for their first post-war meeting. Because of the ramifications of labor difficulties, strikes, and the closing of manufacturing plants because of the lack of materials, railway procurement problems are more acute now than at any time during the war years.

Many railroads had hoped to receive considerable new rail to replace that which had taken such terrific punishment during the war, but because of the steel, coal and railroad strikes it is extremely doubtful if they will receive as much rail during 1946 as they did during the war years. In addition, cross and switch tie shortages are still a procurement problem. Tie production has shown some sign of improvement during the first half of 1946, but for numerous reasons, foremost of which are the low O. P. A. ceilings that have prevailed, the shortage of creosote, and the continued labor shortage in many producing areas, the tie situation is far from rosy.

While shortages of rail and ties are among the most critical, the thousands of other articles needed daily for proper maintenance of roadway, bridges, buildings and equipment are no less difficult to secure, and as conditions exist at the moment there is little prospect for a radical improvement in the supply situation during the remainder of this year.

Despite this critical situation, railway procurement officers have found it both possible and profitable to participate in the affairs of the Purchasing and Stores Division. In times of such stress co-operation is needed more than at any other time, and the P. & S. Division is the agency through which this collaboration is effectively achieved.

Officers and General Committee Members of the A. A. R. Mechanical Division

R. G. Henley,
Chairman

J. M. Nicholson,
Acting Vice-Chairman

A. C. Browning,
Secretary

V. R. Hawthorne,
Executive Vice-Chairman

A. G. Kann

F. K. Mitchell

H. T. Cover

B. M. Brown

J. E. Goodwin

H. B. Bowen

A. K. Galloway

C. B. Hitch

J. Gogerty

O. A. Garber

Mechanical Division Meets After 5 Years

Well attended sessions consider reports of 13 committees—General Committee accounts for its conduct of Division business since 1941

AFTER five years' suspension of its regular annual meetings, caused by the intervention of World War II, the Mechanical Division, Association of American Railroads, resumed its full-membership activities with a two-day meeting which was held at the Hotel Congress, Chicago, on August 8 and 9. That the work of the Division, for the benefit of the member roads, has been going forward throughout this period, however, including much committee work of importance to the railways' participation in the nation's war program, scarcely needed the reminder of the list of activities set forth by the General Committee in its accounting for its stewardship in the management of the Division's affairs since the last full-membership meeting at St. Louis, Mo., in June, 1941.

The first session of the Chicago meeting was addressed by a railway executive who spoke on the problems of training future officers; by a member of the Interstate Commerce Commission, who spoke on the need of improvements in maintenance affecting safety; and by an officer of the A. A. R., who looked ahead at the problems of providing an adequate freight-car supply. Abstracts of these addresses and of the committee reports and discussions are presented below.

Election of Officers

In its report the Nominating Committee called attention to changes in membership of the General Committee because of the deaths of H. W. Jones, chief of motive power, Pennsylvania System, and Walter H. Flynn, general superintendent motive power and rolling stock, New York Central System. J. M. Nicholson was elected by the General Committee to serve as acting vice-chairman, succeeding Mr. Jones, until the present annual meeting. To succeed Messrs. Jones and Flynn as members of the committee it elected H. T. Cover, who succeeded Mr. Jones as chief of motive power, Pennsylvania System, and F. K. Mitchell, who succeeded Mr. Flynn as general superintendent of motive power and rolling stock, New York Central System, for terms expiring with the present meeting.

The following officers were elected to serve until June, 1948: Chairman, J. M. Nicholson, assistant to vice-president, Atchison, Topeka & Santa Fe; vice-chairman, A. K. Galloway, general superintendent motive power and equipment, Baltimore & Ohio.

Because the terms of all members of the General Committee have expired since the last full member election, the Nominating Committee proposed a complete slate of members divided in two groups, one to serve for one year, until June, 1947, and the other for two years, until June, 1948, in accord with the rules of order of the Division, which provide that one-half of the General Committee shall be elected each year. The following were elected for the one-year term: H. B. Bowen, O. B. E., chief of motive power and rolling stock, Canadian Pacific; B. M. Brown, general superintendent motive power, Southern Pacific; J. Gogerty, general superintendent motive power and machinery, Union Pacific; J. E. Goodwin, chief mechanical officer, Chicago & North Western; A. G. Kann, general superintendent of equipment, Illinois Central System; F. K. Mitchell, general superintendent motive power and rolling stock, New York Central System. The following were elected for the two-year term: H. T. Cover, chief of motive power, Pennsylvania System; O. A. Garber, chief mechanical officer, Missouri Pacific Lines; R. G. Henley, general superintendent motive power, Norfolk & Western; C. B. Hitch, chief mechanical officer, Chesapeake & Ohio.

Training Prospective Officers

By L. L. WHITE

Vice-President, Chicago & North Western

"Employee relations," "employee training," "job methods," "job relations,"—terms which were once foreign to our vocabulary, have in recent years, and particularly under the impetus of wartime demands upon practically every person in the nation, taken on a new meaning, with tremendously important and far-reaching significance. Indeed, employee relations and employee training have evolved into a highly developed science, and presently there are a number of institutions and organizations which are devoting all of their talents and energies to the furtherance of this activity.

If the railroads are to keep pace with the other branches of industry, and with the rapidly and ever-changing times, it behooves railroad management, wherever it has not already done so, to inaugurate a sound and systematic program for training employees. The immediacy of the need is, I think, readily apparent; and let us not for one moment forget that the actions we take or fail to take today will play a major role in deciding the issues of tomorrow.

It is, indeed, to the credit of mechanical department personnel, and particularly to the leaders of that segment of the railroad family, that they have made greater strides in the realm of planned training than have the other major departments.

The *need* for training men for official positions has always been with us, but unfortunately we have been rather slow to recognize it as such. Our slackness in this regard, I think, has been due to several reasons, chief of which is the fact that for many years railroading was generally regarded as a preferred occupation. Frequently it was necessary to have connections or "pull" to secure a place on the waiting list for a job, and many of the most ambitious young men in our communities chose railroading for a career because it offered the most attractive opportunities. Production of reasonably capable officials was more or less automatic, and required less planning, supervision, and encouragement than are now needed.

That situation does not obtain today. In the first place, we do not presently offer as attractive a proposition to prospective employees as do certain other industries. In the second place, we are considerably restrained in selecting the best candidates for promotion because seniority has established priority as the principal requirement for advancement and job selection. Union organization of supervision has made it even more difficult for ambitious individuals to prepare themselves for promotion. Under these circumstances we have little alternative but to take the available timber and improve on it, not over a protracted period of time, but as quickly as possible.

Even the improvements and new equipment which wartime activities demanded and expanded earnings permitted us to purchase may not prevent a recurrence of

financial difficulties. As you undoubtedly are aware, we have not yet been able to secure adjustment of rates to compensate for increases in the cost of doing business. In addition to our recent loss of revenues, we must face the fact that we are again competing with other modes of transportation which, unfortunately, at the expense and to the detriment of railroads, are still being encouraged and assisted by means of subsidies by the federal government under the pretext of national defense, or for political reasons. The proposed St. Lawrence River waterway and the appropriation of public funds to build airports for use by commercial air lines are but two examples of what I have reference to.

Not only do we face the risks inherent in normal, healthy, progress-stimulating competition, but we must also bear the government-imposed yoke of discrimination in favor of rival agencies of transportation. For that reason, if for no other, the best leadership will not be too good.

Potentials Not Attained

We have but scratched the surface so far as the potentials of employee training are concerned. Indeed, I think we have done a rather poor job in acquainting both employees and the public on railroad problems. A recent poll of railroad employees indicates that the average railroader has slight conception of vital railroad facts and problems. If he who is a member of the family is so woefully uninformed, what can we expect of the public?

Where will we find our prospective official? It is most likely that under present conditions he is already an employee, having entered railroad service of his own accord. He probably likes his job, but is poorly informed on railroad problems. When he was hired he should have been, but probably was not, thoroughly instructed in the policies of the company, the relation of his job to overall operation, and the prospects and methods of advancement. The importance of this phase of primary training during the first few days or weeks of the employee's association with management cannot be over-stressed, because any and all supervisors are considered "management" by those whom they supervise. The labor organizations lose no time in seeing that the new employee becomes familiar with their version of his rights and prerogatives, but I wonder how often management has failed to instruct him in his duties, his obligations and his opportunities.

Map of the Training Program

After the indoctrination of the new employee, and after the preliminary work that has been done to adjust him to his new surroundings, he must be taught to become proficient in the particular trade or profession in which he is employed. This cannot be done by any centralized or standardized training method, for a number of reasons. Standardization is impractical because of the variety of trades, skills and accomplishments which are required of the people who run a railroad. It is also impractical because railroad properties are extensive and the employees are spread out over large areas instead of being concentrated as is the case with industries in general.

It is, therefore, evident that a railroad-training program must follow the line of railroad organization, with the contact and direction of effort stemming from the officer in charge to his immediate subordinates—they in turn branching out to those whom they supervise, and so on down the line to the man in the field. The major problem is to devise means of getting the information which we wish implanted among our employees thoroughly distributed and completely understood.

I liken this method of dissemination of knowledge and instruction to the chain letters which were popular some years ago —when at the postman's knock we had visions of being deluged with nickels, dimes and dollars contributed by those who were equally desirous of getting something for nothing—in that if any person along the line failed to send in his dime, dollar, stamp, or whatever it was, the chain was broken. That is what happens in training programs, which makes it absolutely necessary that spot checks be made by the proper supervisory persons at regular intervals to see that there has been no break in the chain.

It is, indeed, most unfortunate when the transmission line becomes broken or fouled. What happens is that the younger men, that is, the newer employees from whom our future supervision may be derived, will be the ones who will most likely miss the things we want them to get, just at the time when they are most susceptible to training. I believe firmly in the value of lessons which are learned by doing the job, but it is also highly important that supervision and encouragement be provided generously, not only when a man is starting a new job, but for some time while he is working at it. The training of prospective officials is something that I, for one, like to think of as starting the day the new employee enters service. That is why I have emphasized the new employee and the problems connected with his training.

Provide for Broad Experience

Assuming that we still have control over some of the subordinate supervisory jobs so far as assignments are concerned, it is desirable that younger men of ability be transferred from job to job in order that they may master as much of the various aspects of railroading as they can. Where this is accomplished on a large scale, a supply of well-trained potential supervisors and officials will be our reward.

A rather perplexing situation sometimes develops when a supervisor whom we have been grooming and preparing for further promotion, when offered the promotion, declines to accept it. His refusal may stem from lack of confidence in himself or his management, or other reasons, but when this happens it shoots our best-made plans full of holes. It indicates, among other things, that somewhere along the line we failed to condition that employee or supervisor properly.

We should do everything possible to attract college-trained men to railroading. We must have the benefit of their special training in the new developments of science. I am delighted to observe that the Mechanical Division is again offering its special scholarship at Stevens Institute of Technology to sons of members of the Division.

To develop an all-round mechanical man requires that he should have had as much practical experience as possible with varied situations. He should be assigned to a number of shops, roundhouses, repair tracks and transportation yards, on day and night shifts, and in large and small terminals. This requires him to move rather frequently, and to accept assignments which may not always appeal to his family or himself. Encouragement and the prospect of further advancement are essential in such instances.

Similarly, it is of great value to any man who aspires to be an official that he have an opportunity to work in more than one department. It is the obligation of railroad management to see that these opportunities are provided.

Selection of Candidates

I urge that former hit-or-miss methods of selecting men for advancement be superseded by precision methods, which might well be described as the processes of elimination. This does not require a trial performance, but necessitates a canvass of the available manpower and a rating, based on age, ability, personality, integrity, interests, ambition, etc. This rating may or may not require written records. I suggest it is preferable that there be no written record, and certainly no publicity should be given such information.

I have had department heads tell me that they had no one to promote to fill vacancies, and when I prompted their use of the process of elimination, they were able satisfactorily to fill the job within their own department. Waiting until the last minute, of course, is neither desirable nor safe. To be effective, the rating I have in mind is a running affair that is being constantly studied and brought up to date. What we are mainly trying to develop is leadership, which resolves itself into two parts: (1) the ability to get along with people, and (2) the art of instructing others.

It is unfortunate, but true, that not all supervisors are leaders. Those who are not must have more assistance and guidance than others. Intradepartmental transfers may or may not be helpful in bringing out this quality. If a man cannot handle more than his present responsibilities, it would be unwise to crowd him into a bigger job. It is also unfortunate, but likewise true, that not all supervisors are good instructors. It is to overcome these deficiencies that we must carefully plan our training program to bring out the best in what we have and develop sources for prospective officials of all types.

Program-Building Sources

The War Manpower Commission during the war sponsored a Personnel Committee which developed a program of training that can be very well modified to suit our present needs. This program should be sponsored by the executive officers of the railroads; its details should be developed and put into practice and followed up by an

employee-training specialist, who should be attached to the executive or personnel office. The usual methods of contact may be employed, such as local, divisional, or system staff meetings; by the distribution of circular letters and courses of study, and by the use of moving pictures and slides that are sound-tracked.

We have a fine means of contacting our men on railroads through division and system officers who are regularly on the road. They can determine whether the local people are sufficiently interested in the program, and where they are not, the traveling officers are at least in the best position to undertake to arouse that interest. Not the least important part of the program is the necessity for keeping the men informed of our aims. If we fail in that, it is no wonder that we do not succeed.

There are certain fundamentals which are necessary to success in an undertaking of the type of employee training described. Good railroad officers are not born, and only rarely do they float into our laps through mere chance. An acknowledgment of these facts, coupled with a true evaluation of past accomplishments and failures, as well as present objectives, constitutes the logical foundation for the next requisite, which is the formulation of a sound policy and a systematic method of training employees.

The third step, of course, is a constant check to determine that the program is functioning efficiently and serving the purposes intended.

Significance of Leadership

Above all, it is absolutely essential that the program be sparked by the head of the department. I don't care what the movement is, whether it be employee training, safety first, perfect shipping month, Community-Fund campaign, or what have you, unless it has the genuine, wholehearted, and unstinting support of the department head, it is doomed to failure from the outset.

When we train men to be leaders in industry, that leadership is not restricted to their eight, nine, ten, or more hours on the job. Leadership is not something we don when we take up our task in the morning, and then place in the desk, the file cabinet, or roundhouse, or storeroom when quitting time comes around. It is constant, and the same leadership that we develop primarily for on-the-job purposes finds equal expression by those whom we train in their home communities, their fraternal organizations, the Mechanical Division, and in local, state, and national civic and political affairs.

There are those in our country, yea, in the very halls of government and in the seats of authority, who are seeking by every device to pervert the very principles upon which our beloved country was founded, and in the defense of which your sons have so lately given their lives and their limbs; who are striving to make the individual subservient to the state—nothing more than a cog in the wheel; who are seeking to destroy forever the principles of equality to all and free enterprise under the exercise of which the United States has become the greatest nation on earth; who are endeavoring by every means known to them to foist upon true-blooded, red-blooded Americans the foul isms of decadent nations, of peoples who love not America nor her people.

America needs leadership, and it is your sacred duty and mine, in so much as it lies within our power to do so, to help develop that leadership, not only that our industry may be prosperous, but that our country may be free.

Equipment Failures Too High

By HON. W. J. PATTERSON

Member, Interstate Commerce Commission

I congratulate the Mechanical Division, its officers and members upon the magnificent job of maintaining rolling equipment in suitable condition for expeditious transportation during the most difficult war period. Material was scarce. Substitutes had to be used to a considerable extent. Man-power was hard to get, and, to a large extent, inexperienced. As a result of these conditions and the intensive use of equipment, it gradually deteriorated until now it has reached the point where equipment failures are perhaps the greatest contributing factor in train delays, and such delays are becoming more numerous. These conditions, accompanied by a let-down of inspection, also resulted in an increase in accidents.

It is time now to commence to restore the efficiency of the plant. Perhaps 25 per cent of the cars now in service should be retired without delay. I understand 500,000 freight cars are more than 26 years old, and for the last five years you have been getting two years' mileage out of each year's service. There is perhaps need for 150,000 new freight cars, a large part of which are long overdue. Empty good-order cars are mighty scarce at the present time.

Some Recent Developments

The commission, by order of September 21, 1945, required that on or before January 1, 1949, air brakes conforming to certain specifications be installed on all cars used in freight service, except those equipped with passenger-car brakes. If it is necessary to extend the time within which cars used in interchange must be equipped, it will be because the manufacturers have failed to deliver the equipment. The railroads are absorbing all the equipment they can get.

Hand brakes on passenger-train cars are not as well maintained as those on freight cars, perhaps due to the relative infrequency of their use. However, when an emergency arises in which human safety is involved, an efficient hand brake is just as necessary on a passenger car as it is on a freight car.

The manner of detail construction and maintenance of cars is important. During the last six years we have investigated 12 accidents which were directly or indirectly caused by failure of some part of a car. These accidents resulted in the death of 109 persons and the injury of 361. Four were caused by broken journals, two by broken wheels, two by defective couplers, one by a defective equalizer bar of a passenger-car truck, one by a broken truck side-frame, one by a loose wheel and improper adjustment of side-bearing clearance, and one in April of this year, by a loose wheel on a passenger-train car, which had been turned down to full tread and flange contour and remounted on a second-hand axle. Several, if not all, of these accidents probably could have been averted by proper inspection and maintenance, and by better devices and methods for testing materials.

Expedite Car Repairs

I direct your attention to the need for thorough inspection and prompt repair of cars. This is essential both for accomplishment of the humanitarian purposes of the law and to procure efficient and safe operation.

According to our records, 2.58 per cent of the total number of freight cars, passenger-train cars and locomotives inspected by the commission during the first year of the war had defective safety appliances, and this percentage gradually increased to 3.19 per cent during the last year. This increase in defects indicates a relaxation in inspection and maintenance, and is probably accounted for in large measure by the shortage of material and man-power necessary to cope with the abnormal wear and tear and the stress of war-time conditions in general. This situation should promptly be improved.

Many persons responsible for the movement of cars through interchange either do not have a proper understanding of the requirements of law or are not sufficiently concerned about them. It should be emphasized that there is an absolute legal prohibition against the interchange of cars having defective safety appliances, that a carrier which either delivers to, or receives from, a connecting line such defective cars does so at its peril, and that both the delivering and receiving carriers are equally liable.

Braking Ratios

I have from time to time discussed with various committees of this division the matter of braking ratios for freight cars. For years braking ratios, based upon the loaded weight of freight cars, have been entirely too low. Freight cars are now being built with a braking ratio, based on the gross weight, of 18 per cent, and some even lower. If, as is quite possible, a train were composed entirely of such cars, each loaded to full carrying capacity, it would be dangerous to operate such a train at anywhere near normal speed. Freight trains are increasing in length; likewise speeds are increasing. The light weight of the car is

becoming a progressively smaller proportion of the loaded weight. This is a bad situation and something should be done about it; otherwise, the maximum speed of freight trains must be reduced to maintain reasonably safe operation. I am informed that an automatic "compensating" brake has now been developed for freight cars and is ready to be tested in service. The matter of perfecting such a device should receive preferred attention by the railroads.

In pre-war days, the principal railroads developed and practiced standards of repair and maintenance of locomotives which were followed generally by all railroads and which resulted in the fiscal years ended June 30, 1939, 1940 and 1941, in locomotives being kept in the best condition, the least number of accidents, and the least number of casualties due to locomotive failures, ever attained over a comparable period. The acute need for locomotives during the war created conditions which made it impossible to adhere to the high standards previously observed. For instance, obsolete equipment that had previously been scheduled to be retired was restored to service, many skilled employees were lost, there were shortages of materials and of finished replacement parts, and the making of emergency repairs of a temporary nature became necessary. As a result, the general condition of locomotives deteriorated. Accidents and casualties increased.

Locomotive Defects Increase

The trend in defective locomotives, with consequent occurrence of accidents and casualties, has continued to be upward since V-J Day. There has been an increase in the number of locomotives found by our inspectors with defects that should have been corrected before the locomotives were put into use, and increases in the number of accidents and casualties attributable to locomotive failures in the first eight months of the last fiscal year, compared with a similar period in the preceding year.

Necessity for modification of the outstanding rules and instructions for the inspection and testing of steam locomotives and tenders and their appurtenances was indicated. (Mr. Patterson here referred to three locomotive safety devices, namely emergency brake valve outside the cab, tank water-level indicator and reserve air or steam operation of power reverse gears which are required on steam road locomotives built, on or after March 1, 1946, and on existing locomotives not later than June 1, 1948.—Editor)

Much has been said about man failures in connection with accidents to trains. When men in train and engine service encounter an emergency situation they must, in a matter of seconds, make a decision as to what shall be done to avoid an accident. It requires skill and sound judgment, quickly and accurately exercised. This can be done only by men with knowledge, training and experience. Under such circumstances nothing can take the place of experience.

What I have said with respect to train and enginemen applies with equal force to yard and interchange car inspectors. These men should not only be familiar with the Safety Appliance Acts and related orders, but should also have a thorough knowledge of rules governing the interchange of and repairs to cars. They should be familiar with the Manual of Standard and Recommended Practice, the Wheel and Axle Manual, Rules Governing the Loading of Commodities on Open Top Cars, as well as the rules for the Maintenance of Air Brakes and Air Signal Equipment on Locomotives and Cars. Here, again, judgment must be exercised quickly and accurately, which requires knowledge, training and experience.

The same can be said with respect to locomotive inspectors, to the extent that it applies to their particular field. This matter is becoming more important and more complicated with the general use of Diesel-electric locomotives.

Trained Employees Essential

The proper training and utilization of employees and officials is one of the important problems for the railroads to solve. All available knowledge bearing upon the construction of locomotives, cars, and related devices should be available to all who are interested. Research has been given more or less consideration by this division for many years. Some railroads have for a long time had research departments, but there has not been a sufficient co-ordination of their activities, nor interchange of ideas and results, to reach all the railroads. Better standardization of rolling equipment that is constantly interchanged and intermingled could well be the number one job of this Division. It would certainly improve your safety program.

You have perhaps observed that nearly every passenger-carrying railroad proposes to operate at least one streamlined high-speed train to meet public demand. Too often sight is lost of the fact that to operate successfully and safely such a train requires a track structure adapted for high speed, properly signalled and well maintained. The rolling equipment must be rugged, frequently inspected, and all defects promptly corrected. Otherwise, these trains are a menace to the railroad and the public alike.

Car Supply—The Job Ahead

By CLARK HUNGERFORD

Vice-President, Operations and Maintenance Department, Association of American Railroads

Just a few years ago there were a good many people who seemed to have the idea that in the future of America there was no large place for the railroads. Newer forms of transport were absorbing popular interest. Then came the test of the second World War and the realization that despite all that had been done by other forms of transportation there was nothing which could do for this country what its railroads can.

Car days by reasons of measures adopted were multiplied two or three times so that the product of transportation exceeded all expectations. Millions of service miles were run out by these "veterans of the rails" with little or no chance for replacement or rehabilitation. Scarcities in the labor and material supply prevented the rebuilding and renewals so urgently needed to keep the supply and condition of freight-car equipment at normal levels. Thus, the war years took their toll of the freight-car supply—service life was run out faster than it could be replaced or built back into them.

More Cars Needed

In 1944 17,600 new box cars were installed and 21,100 more were put on the rails in 1945 but these hardly equalled the 40,000 lost through retirement in these last two years of the war. Some 10,000 new box cars have been received for the seven months' period ended July 31, 1946, and some 24,000 more are now under construction and on order to further augment the supply. Even with these additions and other thousands which will be added as materials become more accessible many acute shortages will be experienced before the supply again approaches a normal level.

The number 400,000 is not one to cause much concern in a nation where the terms in millions and billions are commonplace, but still it is a figure that will impress and cause nation-wide planning and action by industry and the railroads when it is practically the number of box cars that the shippers of America are loading each week —396,076 carloads of box-car freight for the week ended July 20 and 394,000 for the week ended July 27, the last two weeks of record—an average increase of 26,343 carloads or 7.2 per cent over the loadings for the weeks of August 4 and August 11, 1945, the last two weeks of the war.

Four hundred thousand cars loaded per week out of a total number of approximately 700,000 serviceable box cars means but one thing, the obtaining of the maximum use possible of those box cars. Concurrently with this demand for box cars comes one of the heaviest requirements for open-top cars. The large export coal program plus the domestic demand for coal to drive reconversion and replenish stock piles depleted during the coal strike of April and May has resulted in an unprecedented demand for coal cars. For the weeks of July 13, 20 and 27, the last three weeks of record since the July 4 holiday, coal loading has averaged nearly 190,000 cars per week with the week of July 20, when 190,386 cars were loaded, being the heaviest week of coal loading in more than ten years.

Such substantial coal loadings plus the heavy demand for other commodities requiring the use of open-top equipment also means but one thing—obtaining of the maximum use possible of open-top cars. And this despite the fact that some 50,000 hoppers and gondolas have been delivered new to the railroads during the past two and one-half years.

In order to provide the transportation this country needs it will be necessary for many months to come that we continue to extend every effort to secure the **maximum** use of every car every day. This means expeditious handling by the railroads, the expanding and speeding up of repair programs so that bad-order cars can be restored to service as quickly as possible, prompt loading and unloading by the shippers and receivers, and the maximum practicable load per car. It is not a question of waiting until there are more cars or waiting for the traffic to subside; it is a question of doing the best we can with what we have and doing it now.

Your Mechanical Division, representing as it does the highest standards and achievements in equipment maintenance and manufacture, reflects a solidarity of purpose so necessary to the continued advancement of the railroad industry as it emerges from the war years to accept the challenge of the transportation future. You as railroaders are important parts of that tremendous transportation machine of the American railroads. We have seen how necessary and how vital to victory was the work of that machine in the war just passed. Likewise, its services are no less essential in the years of peace ahead of us. Without its successful working there can be no real reconversion in this country, no substantial relief to the despairing peoples abroad.

Discouraging Outlook

I should like to be able to report to you that everything is promising for the smooth and successful working of the railroads, but unfortunately at the moment the outlook is not too encouraging. At the same time that traffic has receded, operating expenses have increased. You are all familiar with the rises in prices of mechanical equipment, supplies and fuel used by the railroads during the war period. Since the close of the war that rise has continued. It is estimated by the Bureau of Railway Economics that on the basis of this year's operations, the price rises in these items will add more than $500,000,000 a year to railway operating costs over and above what they would have been on a 1941 basis.

During the same five years there have been three general increases in railway wages, and wages as you all know constitute more than half of the railway operating costs. Again figuring on the basis of 1946 employment the increases in wages granted in 1941 added $360,000,000 a year to operating costs. The 1943 wage increase added $334,000,000, and the 1946 wage increase added $675,000,000. To this total increase of $1,369,000,000 per year in wage cost since 1941 there should be added the additional pay roll taxes on the wage increases amounting to $82,000,000 a year.

That makes the total increase in railroad expense this year almost $2,000,000,000 of which almost half or nearly $900,000,000 per year is the result of wage increases and price rises since January 1, 1946.

And on top of that was the enactment into law last week of the Crosser bill which increases railroad retirement taxes and adds approximately $85,000,000 more per year to the railroads' bill.

During the first six months of the year freight rates remained on the same level as they were before the war started in Europe seven years ago. The result was a drop in railway net income from the $274,000,000 earnings in the first six months of 1945 to a net deficit of $43,000,000 in 1946. Effective July 1, 1946, the Interstate Commerce Commission after summary proceedings and pending more extensive investigation, authorized an increase in freight rates estimated to produce about $170,000,000 in added revenue in the last half of 1946, or something more than $300,000,000 on an annual basis. The commission has under advisement the matter of further increases as to which it is conducting hearings this month.

Nor are these financial difficulties the only obstacles confronting the railroads in this trying period of reconversion. Traffic in general as measured in tons of freight carried one mile has decreased during these months of 1946. But there has been no such corresponding decrease in the demand for freight cars. Instead the demand for certain types of equipment, notably box cars, is greater than it was during the war.

The demand for freight cars has increased partly because of a slowing down in the average turn-around time, partly because the average load per car is less than a year ago. The demand for box cars is particularly increasing because of exceptional harvests this year and because a greater proportion of box cars are used to carry less-than-carload freight partly due to the pressure of deliveries which cannot be made in carload lots because of production difficulties.

So I repeat, to meet the demand for freight cars it is going to be up to all of us —and this applies to the railroads certainly as much as to the shippers and receivers of freight—to get the maximum use out of every car every day. That will call for alert transportation operations, for aggressive dealing with mechanical problems, for concentrated attention to the procurement of the materials and supplies without which it is impossible to keep the equipment in good order to operate these railroads.

Report of the General Committee

Restrictions on interchange of liquefied gas-burning equipment and alcohol-burning heaters modified— Changes in rules governing metal run boards proposed

In its report for 1946, the General Committee of the Mechanical Division, listed the 18 meetings it has held to carry on the business of the division since the last annual meeting at St. Louis, Mo., on June 19 and 20, 1941. Records of letter ballots taken since that time and of the Interchange Rule books issued are included.

Because of the substantial negative vote on the proposed revision of Interchange Rule 2 which limits the interchange of freight and passenger cars with liquefied petroleum gas-burning equipment, or freight cars equipped with alcohol-burning heaters, a special subcommittee was appointed which found that two principal objections to the requirement approved by letter ballot in 1945 involved (1) the prohibition of use of wood alcohol as fuel for heaters in refrigerators and (2) the prohibition of use of propane and butane gas in connection with air-conditioning, lighting and cooking in passenger-train cars and as fuel for heaters in refrigerator cars. The subcommittee included more specific objections and facts and came to the following conclusions as quoted in the General Committee report:

"The use and storage of highly-inflammable liquids and gases are restricted by local regulations in some localities and in a few instances they are prohibited. Therefore, the requirements of the interchange rules should not make it mandatory for receiving lines affected to accept cars that contain restricted or prohibited inflammables that would cause violation of such regulations.

"On the contrary, the Bureau of Explosives' regulations permit the transportation of the materials in question when shipped in cars properly placarded and in containers meeting prescribed specifications. Moreover, some railroads have used these materials successfully for a number of years for heating, lighting, cooking, refrigeration and air conditioning on cars equipped with adequate safeguards and maintained and operated with competent workmen and under strict supervision.

"In view of the considerable investment already made in equipment designed for the use of these materials as fuels, and the necessity to comply with the I. C. C. order to provide inside-controlled heat to protect shipments of certain fruits and also for other reasons, many railroads through their vote have expressed their opposition to the modified rule as stated in the letter ballot circular. The feeling is quite general that an unqualified prohibitory rule is not necessary and if adopted would result in numerous special agreements to circumvent it and thereby continue to operat esuch cars in interchange. This would create a very undesirable situation which the Arbitration Committee has sought to avoid in the past and on which it has rendered decisions requiring the abandonment of local rules that were in conflict or inconsistent with the Rules of Interchange.

"It is concluded, therefore, that the rule proposed in the letter ballot circular is unsatisfactory to meet the various conditions outlined in the foregoing. In lieu therefore, a rule to provide that cars with fuel installations meeting specific requirements may be accepted in interchange at the option of the receiving line, the requirements to be established and included in the A. A. R. Manual of Standard and Recommended Practice."

The General Committee report included Exhibit A covering proposed recommended practice in the installation of equipment designed to burn liquified petroleum gases in freight and passenger cars and Exhibit B for alcohol-burning heaters in refrigerator cars.

Constructive Committee Work

The important work of the Loading Rules Committee since 1941 was summarized; also the Mechanical Inspection Department which, among other things, contributed so largely to the successful movement of petroleum products by tank car during the war. The present status as regards AB brake applications and the A. A. R. auto deck were described.

A redesign of the auto deck, worked out in conjunction with the C. M. St. P. & P. has given entirely satisfactory results in service tests and is now being reviewed by the A. A. R. Patent Division to determine whether it can be constructed by car owners or builders without patent infringement.

Proposed changes in interchange rules governing metal running boards and foot boards are included in the General Committee report which states that the following designs have been approved by the Committee on Safety Appliances as conforming with the A. A. R. specifications *for width, clear opening, deflection under load for box and other house cars (including covered hopper cars)* and non-skid features, only: Apex Tri-Lok, Blaw-Knox Electroforged, Irving Type AA Grating, Morton Open-Grip, U. S. Gypsum expanded metal. Authority for the application of these metal running boards is not required, but responsibility for their conformance to U. S. safety appliance laws and A. A. R. specifications is assumed by the car owner.

The work of the Mechanical Division in promoting improved condition of freight cars furnished for loading and thus reducing transportation delays, esuecially during the war years, was emphasized, also the use of substitute materials for locomotive and car construction, emergency freight car designs, and troop sleeping cars.

The report referred to several special studies and committee activities already well publicized in the railway press. It mentioned an appropriation for a refrigerator-car test program which is expected to take about two years and develop relative performance data on all modern designs, such as 40-ft. end-bunker cars, with and without fans; 40- and 50-ft. overhead bunker cars, with both mesh-type bunkers and brine tanks; and with varying thicknesses of insulation starting with the present standard of 3 in. in side walls and 3½ in. in the roofs and ends.

The report summarized research projects, carried out under the direction of the mechanical engineer's office, on the following subjects.

Axles, crank pins, counterbalance standards, geared hand brakes, journal-bearing development, helical springs for freight cars, roller bearings for high-speed freight cars and standard passenger-car journal for all makes of roller bearings, roller-bearing lubricants, hot-box alarm and wheel-slide control devices.

The research office also assisted in, or followed up, work on various other projects, such as trucks for high-speed freight service; standardization of wheels; use of compressed gas; coupler failures; individual problems of railroad officials, inventors, manufacturers, standing committees of Mechanical Division, etc.

The report was signed by Chairman R. G. Henley, general superintendent motive power, N. & W.; Acting Vice-Chairman J. M. Nicholson, assistant to vice-president, A., T. & S. F.; O. A. Garber, chief mechanical officer, M. P.; H. B. Bowen, O. B. E., chief motive power and rolling stock, C. P.; B. M. Brown, general superintendent motive power, S. P.; A. K. Galloway, general superintendent motive power and equipment, B. & O.; C. B. Hitch, chief mechanical officer, C. & O.; John Gogerty, general superintendent motive power and machinery, U. P.; J. E. Goodwin, chief mechanical officer, C. & N. W.; A. G. Gann, general superintendent of equipment, I. C.; H. T. Cover, chief motive power, Pennsylvania; F. K. Mitchell, general superintendent motive power and rolling stock, N. Y. C.

Brakes and Brake Equipment

Slow-release, four-position retainers proposed for advance to the status of standard—A special brake-cylinder release valve saves time in yards

Air-Hose-Coupling Gages — Consideration is being given to additional go-and-no-go gages and instructions for checking air-hose nipples and couplings to supplement the present gages which do not check with the nipple portion.

The committee recommends that the Recommended Practice brake-pipe coupling gages shown on page B-3 of the Manual be advanced to standard and the drawings modified as shown in Figs. 1 and 2, and that the words "type F" be added in the second line of the title between the words "used" and "couplings"; also that signal hose type H coupling gages, Figs. 3 and 4, and straight-air-line hose type E coupling gages, Figs. 5 and 6, be submitted to letter ballot for adoption as Standard Practice. [The illustrations are omitted.—Editor]

Cleaning AB Brakes—In response to Circular D. V.—1082, dated February 14, 1945, in regard to cleaning all cars still in service with "Experimental AB Brakes": Reports have been received from a number of railroads, but a complete report cannot be made at this time, due to the number of cars not yet reported.

Charging Test—Investigation of reports of some cases of brakes not applying on cars equipped with AB brakes was found to be generally caused by excessive charging time. Therefore, it is considered necessary to establish a definite limit for this time which is not specified in any of the Instruction Pamphlets.

It is recommended that the time limit for charging from 0 to 70 lb. with 70 lb. driving head pressure, for AB brakes on repair tracks, shall not exceed 15 min. and that valves failing to charge in this time be considered inoperative. Providing this requirement is approved by letter ballot it will be included in the A. A. R. No. 5039-4, Sup. No. 1, Instruction Pamphlet, Single-Car Testing Device—Code of Tests.

A number of railroads have made charging test on AB valves using the 15-min. time limit on cars that have been in service approximately three years since the last air-brake periodic cleaning and report that this time limit would not be objectionable.

Gages for AB-Valve Parts—By direction of the General Committee, circular letter was issued to the members and private car owners under date of August 10, 1944, specifying the use of six gages for various parts of the AB valve when taken apart for cleaning or repairing. It is recommended the use of these six gages, together with instructions for their use, be submitted to letter ballot for adoption as standard practice.

Increase in Cleaning Period

Progress in tests to determine if the cleaning period for D-22 control valves can be advanced from 15 to 36 months was reported. A complete report, with recommendations, will be prepared after the three-year period has elapsed.

Spliced Hose Out after 1946—Recommendation was made to the Arbitration Committee that the application of spliced hose be abrogated, but the rules revised to permit the interchange of cars now equipped with spliced hose for at least one year, or until the spliced hose becomes defective. This was concurred in by the Arbitration Committee and included in the 1946 Code of Interchange Rules, with proviso that after December 31, 1946, the use of spliced air hose will not be permitted on cars in interchange.

AB Accelerated Release Caps—A. A. R. Leaflet No. 2391, dated June, 1945, published by the air brake manufacturers, prohibits the replacement of the accelerated release caps with plain caps on "AB" valves so equipped. The Brake and Brake Equipment Committee has now authorized the replacement of defective accelerated release caps with plain caps.

Brake Cylinder Piston Lubricator—

A design of non-pressure head for passenger-car brake equipment with a piston sleeve lubricator similar to that developed for the "AB" cylinder was submitted by the manufacturers and approved.

Question Single-Car Test Device—A subcommittee has for some time been studying the necessity for amplifying the single car test code for "AB" valves, as shown in the A. A. R. Instruction Pamphlet No. 5039-1, for the purpose of determining whether the present Single Car Test Device and Test Code are entirely satisfactory for present day operating conditions. All committee members were requested to make tests on a number of cars for a three month period, using an amplified test proposed by the subcommittee, after which, further report will be submitted.

Slow-Release Retainer Valves—The committee wishes to recommend, as a letter ballot item, that the recommended-practice four-position slow-release retaining valve adopted in 1941 and shown on Manual page E-33 be advanced to standard, to replace the present standard three-position 10-20 lb. duplex-spring type retaining valve referred to on page E-12 of the Manual; also, that the Interchange Rules be modified to require that cars built new on or after January 1, 1947, must be equipped with the new standard four-position slow-release retaining valve.

Inspection of Armored Hose on Passenger Cars—A number of cases of flat wheels and stuck brakes on passenger cars equipped with the D-22 control valve and truck-mounted brake cylinders have been reported, some of which were caused by defective inner lining of the hose or damaged armor which restricted the flow of air. As many of these hoses have been in service for a long period of time without receiving any inspection, instructions will be sent to all members which should be followed for the inspection of armored hose used with air-brake equipment.

Committee Reviews Substitute Materials—The committee reviewed a list of 45 items submitted by the manufacturers of AB equipment parts, in the manufacture of which the use of substitute material had been approved for the emergency period. The list also showed what the manufacturers will use to reconvert as the material becomes available.

In some cases it was found that it was desirable to continue the substitute material used during the emergency, due to its better performance than the original material. On account of trouble being experienced with plastic material used in bushings, four of the items have been referred back to the manufacturers for further consideration.

Allpax Non-Pressure-Head Packing—It is recommended that member roads make a trial installation of Allpax ring packing to some of the old style "AB" brake cylinder non-pressure heads on non-interchange cars when the non-pressure head is equipped with the three-metal-ring and lubricator-type of packing. The committee has conducted tests on six Pennsylvania cabin cars which were equipped July 10, 1944, some of which were examined after 20 months service, when the examination indicated that they should perform satisfactorily for the three-year air-brake cleaning of "AB" brakes.

No change is necessary in the construction of the non-pressure head when the Allpax ring packing is installed.

AB Brake Cylinder Release Valves—A specially designed AB brake-cylinder release valve for the purpose of releasing AB brake cylinder pressure only to release brake, instead of draining both the auxiliary and emergency reservoirs on cars in yards, was installed on 22 Great Northern ore cars in August, 1945. The committee visited the repair tracks on April 24, at Allouez, Wis., where the Great Northern had assembled twenty-two of their 24-ft. ore cars equipped with these brake-cylinder release valves. Twenty-one of these cars, which had been in operation since last fall with a record of 30,000 miles, were coupled together on a repair track, and the following tests were made:

The train line was charged to 73 lb.; an emergency application was made, the brake-cylinder release valve was pulled on each 24-ft. car by one man in a total time for the 21 cars of 1 min. 32 sec.; after which the auxiliary reservoir was recharged to 70 lb. in 1 min. 34 sec., and the emergency reservoir to 70 lb. in 2 min. 12 sec., with 73 lb. brake-pipe pressure.

The train line was charged to 73 lb.; an emergency application was made, the auxiliary and emergency reservoir were drained on each 24-ft. car in a total time for the 21 cars of 7 min. 41 sec.; after which the auxiliary reservoir was recharged to 70 lb. in 10 min. 57 sec., and the emergency reservoir to 70 lb. in 11 min. 27 sec.

It will be noted that considerable time can be saved by the use of these valves in getting AB brakes released.

The operation of this release valve is accomplished by giving a short time pull on a release rod from either side of the car, this rod being similar to that used on the reservoir release valve. This operation automatically closes brake-cylinder supply air and exhausts brake cylinder pressure. The valve is automatically returned to its normal position when the brake-pipe pressure is increased.

The report was signed by: J. P. Lantelme (chairman), general foreman, Penna.; H. I. Tramblie (vice-chairman), air-brake instructor, C. B. & Q.; W. H. Clegg, general superintendent motive power and car equipment, G. T. W.; L. D. Hays, air-brake engineer, N. Y. C. System; D. R. Collins, superintendent air brakes and general road foreman of engines, D. & R. G. W.; R. N. Booker, general air-brake inspector, Sou. Pac.; R. J. Watters, general air-brake inspector, Nor. Pac.; O. H. Swan, supervisor air-brake instruction, U. P.; R. E. Anderson, general air-brake inspector, C. & O.; F. T. McClure, supervisor air brakes, A. T. & S. F.; A. J. Pichetto, general air-brake engineer, Ill. Cen.; and R. G. Webb, superintendent air brakes, C. M. St. P. & P.

(*The report was accepted and its recommendations ordered submitted to letter ballot.*)

Report of the Journal-Bearing Development Committee

Emergency designs to conserve non-ferrous metals tested and found satisfactory — Bearings-in-scrap surveyed to determine causes of scrapping—Possible future developments in journal bearings listed

The committee was set up late in 1941 as an emergency war activity under the national program for the curtailment of critical and scarce materials. At that time, the nation was faced with future shortages in copper, tin and other non-ferrous metals and, in the interest of the national defense, the railroads were requested to curtail the use of these metals through reduction in weight, changes in composition and substitution of less critical materials in railway equipment wherever possible. The non-ferrous metal in the railway car journal-bearing pool represented a considerable tonnage which was considered as a possible source of critical materials for war use and the railways, through the A. A. R., were requested to carry out:

(1) Immediate curtailment of critical materials to the extent possible through weight reduction and change in composition and (2) undertake a program of research to develop substitute designs and materials to make the major part of the metal in the journal-bearing pool available for war use if and when required. This committee was set up to carry out this assignment.

To enable the committee to proceed on a factual basis insofar as possible under the war emergency conditions, arrangements were made to utilize the existing laboratory facilities of the Railway Service Supply Corp., Indianapolis, Ind. This organization had designed and installed a railway car journal-bearing testing machine where full sized 5½-by-10-in. bearings could be subjected to a range of load and speed conditions simulating service, and performance observed and recorded by appropriate instruments.

The work at Indianapolis carried on under the direction of the committee has been progressively reported in a series of bulletins distributed to the members through the office of the executive vice-chairman, Mechanical Division. [A list of the bulletins on this work follows; it is not included in this abstract due to lack of space. Another list containing the progressive

modifications in car journal-bearing design put into effect by the A. A. R. as the result of this program is likewise omitted. —Editor]

As the result of the war emergency, valuable information relative to car journal-bearing design has evolved through what is to be considered as a service test on an unprecedented scale. To evaluate the effect of the plan-view dimensional changes made in the so-called emergency design in comparison with those of the pre-war design, committee members made an individual check of bearings-in-scrap during 1942-43, which indicated that end wear and spread linings had been materially reduced through the dimensional changes made in the modified and emergency design. In order to develop a factual basis for comparison on a more comprehensive scale, a group of 25 member roads in the United States and Canada were requested to make a check of bearings-in-scrap for a 12-month period ending with November, 1945. The total of 1,274,328 bearings checked in 5- by 9-in., 5½- by 10-in. and 6- by 11-in. sizes consist of 717,182 pre-war and 557,146 emergency designs. No differentiation of the crown thickness changes made in the emergency design bearings during 1943-44 was attempted in this survey.

End-Wear Statistics

The significant facts made available through this survey are shown in a tabulation which is omitted in this abstract. These showed end-wear totals (lug end, fillet end and both ends) accounted for 33.94 per cent of the pre-war and 21.88 per cent of the emergency bearings; spread lining for 24.7 per cent of the pre-war and 16.24 per cent of the emergency bearings; non condemnable for 13. per cent of the pre-war and 25.08 per cent of the emergency bearings, and ran hot in service for 6.47 per cent of the pre-war and 12.95 per cent of the emergency bearings.

The statistics for end wear reflect the influence of the shortening of the bearing at the lug end and changes in lug location and collar thickness to reduce the contact of the lug end of the bearing with the axle end collar.

The effect of the reduction of the c dimension (width) is reflected by the decreased percentage of spread linings. These two items taken together reflect the influence of the plan view dimensional changes made in the emergency design and indicate that the changes made were effective and not excessive.

The relatively high percentage of emergency bearings scrapped when not condemnable under Rule 66 and ran hot in service appears to have been due to something other than bearing design. Apparently, poor judgment or misunderstanding of the conditions attending the change in bearing design resulted in large numbers of serviceable emergency design bearings being scrapped on periodic repacking inspections at many points throughout the country. The higher percentage of emergency design bearings involved in overheatings may be explained as due largely to the fact that during the period of the survey only emergency design bearings and relined bearings were available, hence these bearings had to take the brunt of the break-in period, as well as rebrassing on damaged journals to get cars into repair points after developing hot boxes on line.

Recommendations

At a meeting held in Chicago on May 1, 1946, the committee again reviewed the question of journal-bearing dimensions, and after careful consideration of the several suggestions covering a post-war A. A. R. standard design, made a report to the General Committee recommending:

(1) Design shown on Page E-D-24-1945 be advanced to standard replacing the present standard design shown on Page D-24-42 of the Manual.

(2) Procedure indicated in (1) be submitted to the Association as a letter ballot item.

Service Tests

As a part of the research program involving investigation of bearing design modifications with an object of further reduction in weight of critical and scarce non-ferrous metals over that realized in the emergency design modifications, the committee members made service tests of the designs indicated as most promising through the laboratory tests of the machine at Indianapolis. These service tests, all of 5½- by 10-in. journal size, were started in 1942 and concluded during 1945. These road tests are of general interest as indicating the further possibilities in conservation of non-ferrous metals in railway car journal bearings which could have been put into effect had the available supply of non-ferrous metals become more critical.

In compliance with a request by the Association extended to bearing manufacturers, railway supply companies and individuals to submit ideas for bearing design modifications in the interest of the national conservation program, the Railway Service & Supply Corp., Indianapolis, Ind., submitted a design of two-piece bearing. This design, which became known as the V-Bearing, consisted of a malleable-iron adapter and a light-weight lined bronze-back bearing insert. Laboratory tests of this design were made during June, 1942, and road tests conducted during that summer indicated that bearings of this design would give satisfactory service.

As a part of their development work, the R. S. & S. C. constructed a pilot plant at Indianapolis for manufacturing and assembling the V-bearing parts from die-formed castings and centrifugally lined bearing inserts. During October, 1942, the committee recommended the approval of a service test of a total of 20,000 assemblies of this design in interchange service. On Feb. 10, 1943, the General Committee approved test of a minimum of 8,000 V-Bearing assemblies in 5- by 9-in., 5½- by 10-in., and 6- by 11-in. sizes as divided between 20 roads, the roads applying these bearings for test to keep a record and advise the committee of the service obtained.

Owing to manufacturing delays, a total of only 2,336 of the V-bearing assemblies, all 6- by 11-in. size, were shipped. Returns from the 7 roads that have applied these bearings for service test are not sufficiently complete for the committee to make a report at this time but from available information, the limited number of V-bearings under test appears to be giving satisfactory service.

Future Possibilities

The research program and supplementary studies carried out by the Committee on Journal-Bearing Development during 1942-45, as a war activity, was sufficiently comprehensive to indicate the direction along which further improvement of the solid type of car journal bearing for railway equipment should be directed.

Two lines of future development appear to be open:

(1) Further improvement of bearing and associated parts in the present journal-box assembly insofar as modifications and refinements can be carried out to interchange with present parts during the necessary transition period.

As applying to the bearing, the following possibilities for further improvement are open:

(a) Tightening up of manufacturing tolerances and improvement in production procedure and finish of essential contact surfaces to correct the irregularities in the pre-war foundry product.

(b) Improved manufacturing practice and control insure a more uniform bonding of linings to backs.

(c) Changes in finishing and gaging procedure at bearing manufacturing plants to establish closer alinements of wedge contact surfaces with journal-bearing surface.

It is to be noted here that the above refinements will classify the car journal bearing as a finished part and that this step will not be economically justified without corresponding refinements in the wedge and in the registering and contact surfaces in the journal box.

(2) Redesign of the entire journal-box assembly with the object of realizing the full possibilities of the solid type bearing to improve road performance over that obtainable with the present conventional set-up. This is a full-time research project which could well be undertaken by the Mechanical Division but which involves such design study and follow up procedure as to be outside the scope of the committee's assignment.

Any post-war research program undertaken by the Mechanical Division to continue the study of journal-bearing development, should be broadened to include roller bearings and to establish the engineering and economic facts pertaining ton anti-friction vs. solid bearings for railway cars in interchange service.

The members of the Committee on Journal-Bearing Development are: J. R. Jackson (acting chairman), engineer of tests, Mo. Pac.; J. W. Hergenhan, assistant engineer test department, N. Y. C. System; V. C. Barth, chief chemist, C. & N. W.; L. B. Jones, engineer of tests, Penna., and C. B. Bryant, chief engineer, Technical Board, Wrought Steel Wheel Industry.

(The report was accepted and its recommendations ordered submitted to letter ballot.)

Report of Lubrication Committee

Data are included on lubricants for roller bearings; field tests on journal-box lids; hot-box statistics— Report on accident prevention due to hot journals

Roller-Bearing Lubricants

A first progress report, approved by the committee at the meeting on April 30, 1946, relates to the tests carried out on the journal bearing testing machine in the laboratory of the Railway Service & Supply Corporation, Indianapolis, Ind., and to supplementary studies of the lubricants in the laboratories of the Pennsylvania and the Southern.

All running tests reported were made during the year 1945 with an S. K. F. roller-bearing assembly mounted on the testing machine.

The object of the investigation was to study the behavior of the lubricants currently used by railroads for the lubrication of roller bearings on railway equipment cars, with a view of developing information leading to a better understanding of the basic factors involved and a more uniform practice by the railroads of the country as to the characteristics of the most desirable roller-bearing lubricants to be used in this class of service. The program did not contemplate studies of lubricants for steam-locomotive roller-bearing axles.

The following general conclusions were drawn from the data presented in the first progress report:

1—The railway type car journal roller bearing, carrying full load and at speeds up to 120 m. p. h., may be successfully operated with a rather wide range of lubricants.

2—The operating temperature of the journal and bearing is largely a function of the viscosity of the lubricant; the higher the viscosity the higher the operating temperature. All lubricants tested showed the tendency to increase in viscosity as a result of operating temperature and time in service.

3—The power requirements to operate the journal and bearing increases as the viscosity of the oil increases.

4—The indications are that the general type of lubricant now used on the railroads for lubrication of the conventional waste-packed solid car journal bearings is also a satisfactory and an economical lubricant for roller bearings under railway cars.

5—The work completed to date is not sufficiently comprehensive to permit formulating a detail specification for a lubricant for all types of roller bearing equipment on cars in interchange service on the railroads.

Based on the work completed to date it was recommended:

1—That the research program be continued and extended under A.A.R. direction to include:

(a) Measurement of the friction of the railway roller bearing versus the solid bearing, starting and running, normal and sub-zero outside temperatures.

(b) Extension of program to include other designs of roller-bearing equipment now in service on the railroads.

(c) Broadening of program to include an investigation of the special roller-bearing lubricants recommended by the petroleum industry for railway service.

(d) Further study of the corrosive influence of lubricants on roller-bearing parts.

2—That this program is of sufficient importance to the railroads to warrant setting up a full-time organization under the A.A.R. Mechanical Division to carry out these recommendations.

Journal Box Lids

The Lubrication Committee's interest in this item lies in improving the present designs of lids and in setting up maintenance requirements to provide an adequate closure at the front of the journal box to insure retention of the oil and exclusion of the dirt and water under service conditions.

Working with the manufacturers, the joint subcommittee assembled samples of modified box lids at Altoona, Pa., for check and evaluation of construction details. From the information thus made available, revision of Specifications M-120 was prepared, submitted to the General Committee for approval, and by their action submitted to the Member Roads as a letter ballot item as Specifications M-120-46 in Circular No. D. V.—1096, dated April 20, 1946.

A summary of the field observations made by the subcommittee showing the conditions of journal boxes and lids in service on owned and foreign freight cars in interchange was circularized to the member roads with the secretary's letter of April 20, 1946.

Recommendations were made to the Committee on Car Construction concerning the application of bushings in hinge-lug pin holes and wear liners on hinge lugs of journal boxes and to set up definite standards for journal-box lids and box hinge lugs and lid registering faces, also repair standards, including gauging and methods of gauging, with the object of improving present conditions. It is felt that the hinge and face of the box should be held to closer mechanical standards to derive the full benefit of the improved box lid provided for in Specifications M-120-46.

In the 1945 annual report reference was made to the device known as the Hold-Rite packing retainer. Upon recommendation of this committee at that time, an interpretation has been included under Rule 66 in the Interchange Code to provide that this device when removed at time of wheel changes and periodic repacking inspections should be replaced if in serviceable condition and standard to car.

The 1945 recommendations of the committee were clarified by a circular letter to the members through the secretary's office under date of December 18, 1945, excerpts of which are as follows:

"To clarify any possible misunderstanding, your committee wishes to advise that the approval of the use of this device has reference only to the latest design, in which the longitudinal wires extending along the sides of the journal box are joined together by a metal band for the purpose of preventing contact with the journal.

"Your committee also desires to advise that their approval is predicated on the use of this device only in journal boxes in which it is properly applicable. The device is not approved for use in journal boxes having integrally cast waste retainer ribs, or in boxes of such other construction as to offer interference in application or removal of the device or to cause contact with the axle journal."

Hot-Box Statistics

The 1944 and 1945 reports included tabulations compiled from monthly statements of freight-car hot-box records on all A.A.R. member roads, from date this record was started (September, 1942). This tabulation was brought up-to-date in this year's report. The monthly statements have been discontinued, as of February, 1946.

Hot-Box Alarm Devices

During the past year this program has been progressed and 29 hot-box alarm devices submitted have been subjected to laboratory tests. Some devices which proved deficient are being further improved by the manufacturer. Other manufacturers have indicated their intention to submit devices, which have not yet been received. Three devices have shown sufficient promise to warrant road tests, and are now in regular road service on Pennsylvania passenger coaches undergoing observation and development by representatives of this committee and the manufacturer.

The work to date has been confined to alarm devices applicable to the conventional design of journal box having the solid type of bearing and a tentative specification covering the requirements of an alarm device for this design of journal box has been formulated. The work of this special committee is being continued and will be extended to cover applications of alarm devices to roller-bearing journal boxes.

During the year there have been several cases of costly derailments attributed to broken journals, where investigation developed that the journal failures originated from heat cracks resulting from previous overheatings and which were not properly removed at the time of checking and refinishing the damaged journals. The Lubrication Committee again emphasizes the importance of providing all wheel shops where overheated journals are reconditioned with facilities for making Magnaflux inspections as required in the Wheel and Axle Manual and by Interchange Rule 69.

The members of the Committee on Lubrication of Cars and Locomotives are: J. R. Jackson (chairman), engineer of tests, Mo. Pac.; L. B. Jones (vice-chairman), engineer of tests, Penn.; E. C. Ellis, superin-

tendent car department, C. & O.; A. J. Pichetto, general air brake engineer, Ill. Cen.; W. G. Aten, mechanical inspector in charge of lubricating matters, C. B. & Q.; J. Mattise, general road foreman engines, C. & N. W.; J. W. Hergenhan, assistant engineer, test department, N. Y. C. System, and D. C. Davis, lubrication supervisor, A. T. & S. F.

Discussion

It was suggested that the committee, in continuing its research on lubricants for roller bearings, give major consideration to the problem of corrosion results commonly known as "water etch." This, according to the committee chairman, is on the program for further study.

Another member raised a question as to the value of a study of friction of roller versus plain bearings on the ground that after a journal is in motion the journal friction is such an insignificant part of train resistance that it is of relatively little importance.

The question was asked from the floor as to whether a journal that had run hot enough to "pick up brass" should be Magnafluxed. To an affirmative answer by the committee chairman the comment was added that in any event such a journal should come out of service and be inspected carefully.

Another member suggested that the ruling recommended by the Wheel Committee as to Magnaflux inspection should have "teeth" in it and that his road had installed 19 testing machines for the inspection of axles.

(The report was accepted.)

Locomotive Construction Report

Diesel standardization, classified repairs and fire protection discussed—All-welded boilers and seal welding of staybolts among steam locomotive subjects

Diesel Statistics

In the 1941 report this committee gave statistics on the number of Diesel-electric locomotives in service by years from 1925 on. It was thought desirable to bring these statistics up to date and in addition, it was thought desirable to make a new check of the cost of operation and maintenance of Diesel locomotives in the light of the greater experience obtained since the 1941 survey.

[Table I showing the number of Diesel locomotives in service as of December 31, 1945, Table II showing the assignment of the Diesel locomotives to various classes of service and Table III showing the average cost figures for various horsepowers in various types of service were not completed by the time the committee report was sent to press, but were presented at the meeting. Tables I and II were submitted in mimeographed form and Table III was presented verbally.—Editor]

Diesel Standardization

The sub-committee in the work of the past year has concentrated primarily on trucks for 600-hp. and 1,000-hp. switching locomotives. The bulk of the locomotives of this type have been furnished by four builders, designated as builders A, B, C, and D.

Summarizing, the situation with respect to 600-hp. and 1000-hp. Diesel switchers at the present time is as follows:

1—Three builders now use essentially the same truck which, while it is mechanically interchangeable as a whole, cannot be interchanged because of differences in electrical characteristics of the traction motors. It is more or less a matter of coincidence that two of the builders have completely interchangeable trucks merely because they happen to use the same traction motors.

2—E-12-X axle can now be used interchangeably on locomotives built by Builders A, C, and D.

3—Journal boxes adapted for standard A. A. R. 6½-in. by 12-in. bearings employing either the A. A. R. or the American Transit Association standard 6½-in. by 12-in. journal bearing, or alternately, the complete journal box or bearing of Builder A can be used interchangeably on these three types of locomotives.

4—Interchangeability of complete wheel and axle assemblies is now prevented by the use of different gears on the various types of traction motors.

5—There appears to be no likelihood of any of the traction-motor manufacturers involved to change either the dimensions or the electrical characteristics of their product, so that complete mechanical interchangeability of the trucks or even complete interchangeability of wheel and axle assemblies can be obtained.

The above represents in effect the progress made since this subject was assigned to the subcommittee early in 1942. Progress was, of course, totally interrupted during the war because existing designs submitted by the various builders were frozen by the War Production Board. In the intervening years, however, a considerable number of switching locomotives of both the 600-hp. and 1,000-hp. size were constructed and placed in service on the railroads. Any attempt to standardize, therefore, must be restricted to new locomotives.

The builders of Diesel locomotives in their efforts to reduce the cost of this type of motive power have, of necessity, been forced to adopt certain standards and adhere to them so that the Diesel locomotive could be built under mass production methods. It is unfortunate that each locomotive builder arrived at his existing standards independent of the other. Having done so, they are, of course, very reluctant to make any radical changes to standardize any parts as between the various builders. It appears that about the only way in which an individual railroad can accomplish any measure of standardization is to buy the locomotives from one source only.

Diesel Classified Repairs

A request has been made by some of the member roads for an outline to cover the classification of repairs to Diesel locomotives. Upon inquiring from railroads represented on the Locomotive Construction Committee, it develops that a considerable number of railroads contemplate making all repairs to Diesel locomotives on a more or less progressive basis, using spare parts and spare assemblies to a very considerable extent. In making ordinary running repairs, cylinder liners, for example, are examined and changed progressively at the time of monthly, quarterly, and annual tests. When the condition of a Diesel engine becomes such as to require general repairs, the entire engine is removed and an overhauled engine is installed. Similarly, truck maintenance is carried on continuously by having spare trucks available and changing them out in rotation. When this is done traction motors are inspected, changed out if necessary, wheels are turned or changed and the brake and spring rigging thoroughly overhauled.

[For those railroads interested in separating repairs into "classified" and "running," a detailed outline used by one of the member roads for that purpose was included in the report. The sub-committee was not prepared at this time to suggest the insertion of this material in the Manual of Standard and Recommended Practices.—Editor]

Fire Protection Equipment

The subject of fire protection equipment has been assigned to this sub-committee for joint consideration with a sub-committee from the Fire Protection and Insurance Section. To date the joint sub-committee has had an opportunity to hold but one meeting and can at this time report on progress only. The substance of the discussion at this meeting was essentially as follows:

1—Housekeeping and Design—In the majority of Diesel-electric road locomotives built to date very little attention was paid in the design to simplify good housekeeping which is a fundamental in fire prevention. In future designs this feature should receive more attention and the cooperation of the Diesel manufacturers should be sought in improving this item.

2—Fire Protection Equipment—In the past the builders of Diesel-electric locomotives have considered fire protection equipment a matter for the individual railroads to settle. Basic locomotive specifications provide wholly inadequate fire protection and it has been necessary for the railroads to supplement that protection. The representatives of the Fire Protection and Insurance Section suggested, with the concurrence of this subcommittee, the following as the minimum of protective equipment with which Diesel-electric locomotives

should be provided, with the hope that this might ultimately be accepted by the locomotive builders as such and included in the specifications of their locomotive:

a. Road Diesel Locomotives—Equipment required per Unit:
   1—Inside—Engine room—Not less than 100 lb. of carbon dioxide, preferably in two 50-lb. cylinders, with appropriate distributing means, or the equivalent thereof in other extinguishing media. Such distributing means may consist of hose, hose racks, or fixed nozzle installations. Operating Cab—Not less than one-quart carbon tetrachloride or equivalent extinguisher.
   2—Outside—200 gal. of water available solely for fire protection purposes propeiled by carbon-dioxide, with foam proportioning tank. For each such installation one 100 ft. of 1½-in. diameter hose complete with play pipe nozzle on each side of locomotive or, as an alternate, the use of water alone and a hose equipped with a fog nozzle.
b. Switching locomotives: One 50-lb. carbon dioxide cylinder, or the equivalent thereof in other extinguishing media, complete with 50 ft. of hose.

The foregoing are to be considered minimum requirements and may, of course, be expanded to any extent desired by the individual railroads. Additional equipment would include thermostatic alarms installed above each Diesel engine and connected to the alarm system for hot engines, with suitable light indication to identify the cause. Smoke detector systems can be installed beneath the body to detect the presence of fire over the trucks and in battery boxes. In addition, suitable means should be provided to protect the oil tank against flying objects.

Piston-Valve Design

This subject was first introduced in 1941, and was held in abeyance because of the war. Recently, it was decided by the committee to reconsider the subject and to handle it to a conclusion.

A questionnaire data sheet is now being prepared and when completed, it will be submitted to various railroads to determine the number of different sizes and styles of ring grooves and rings now being used in piston valves, with a view of standardizing them.

Locomotive Axle Centering

After the A. A. R. Manual page D-4B-1945, covering various car axle centering, was adopted, it was suggested that similar consideration be given to the axles used on locomotives.

The sub-committee has prepared a new page to be inserted in Section F of the Manual to show axle centering for solid and hollow-bored axles for both plain and roller bearings. The committee recommends that one size of lathe center, 1⅝-in. diameter, be adopted for all sizes of axles, disregarding the 1¼-in. diameter as shown on page D-4B-1945, for axle sizes A, B, C and D only.

It is recommended that this be submitted to member roads by letter ballot for inclusion in the Manual as recommended practice. It is also recommended that pages F-99, F-100, F-101 and F-102 of the Manual of Standards and Recommended Practices be revised to agree with the proposed centering.

Weight Distribution

The sub-committee was requested to prepare proposed changes in the A. A. R. Manual to include locomotive springs applied directly over or under journal boxes, so that the springs would be considered dead weight instead of suspended weight. This will require changes in the A. A. R. Manual as follows:

Page F-189-1936: 1—Fourth paragraph changed by rewording as follows: "By 'dead weights' is meant the weight of all parts below the spring rigging, and therefore not supported by the spring rigging *and to include the weight of springs located directly over or under journal boxes.* The total dead weight must be determined for each pair of wheels separately and for driving wheels in the sum of the individual weight as follows":

2—To items on driving wheels add: "2 springs when located directly over or under journal boxes."

Page F-190-1936: 1—To items on trailer truck add: "2 springs, when located directly over journal boxes."

The committee recommended that these changes be submitted to letter ballot.

Wheel-Slide Control Devices

This subject has recently been added to our docket and the request has been made that three members of the subcommittee collaborate with the Car Construction Committee in a joint study with the representatives of manufacturers with respect to standardizing the application of control or other similar devices to locomotive and tender journal boxes.

The 1945 report of the Committee on Locomotive Construction included reference to a proposed revision of the drawing on Page F-171 of the Manual, which shows the standard design of the handwheel for globe and angle valves for a pressure of 300 lb. per sq. in.

The revised drawing has been prepared which shows the outside diameter for each size of valve and also the dimensions for the stem fit, but with no detail for the design of the wheel itself, thus permitting the user to specify the required design or to accept the manufacturer's standard.

Driver and Trailer Tires

The A. A. R. Locomotive Tire Manual of Recommended Practices, adopted in 1937, was re-edited and brought up-to-date in preparation for the publication of a new edition.

To date there have been three locomotive boilers built by the fusion-welding process. One 2-8-0 type boiler was built for the Delaware & Hudson in 1937 and two 4-6-2 type boilers were built for the Canadian Pacific in 1945. Fusion-welded boilers on order include ten 4-8-4 type boilers for the Chicago, Milwaukee, St. Paul & Pacific, six 4-6-4 type for the Chicago & North Western, one 4-6-4 type for the New York Central and one 4-6-6-4 type for the Delaware & Hudson.

[In a summary of the performance of the D. & H. all-welded boiler built in 1937 the report showed that this boiler had made approximately 372,565 miles up to April 1, 1946, with no work having been done on the boiler shell because there has not been a semblance of weakness in the welded seams or in any other parts of the shell construction.—Editor.]

Boiler Materials

While seal welding of staybolts to firebox side sheets has not been standardized on the railroads, progress has been definitely made along this line. Several leading railroads have requested and have been granted permission to seal-weld staybolts to firebox side sheets for test purposes. Seal welding has been applied to locomotives that are in the most severe service, some of these having made approximately 170,000 miles.

Some roads claim that the welding of staybolts to the side sheets will greatly prolong the life of firebox side sheets and eliminate leaking staybolts to a great extent. One railroad has reported that they have equipped the side sheets of four locomotives in this manner. The bolts were run in in the usual manner so that the ends of the bolts project approximately 5/32 in. through the sheet after hammering. To date there have been no leaky staybolts in any of these locomotives since they were equipped and no cracks in the side sheets.

The seal welding method of applying staybolts has not, as yet, been adopted as standard on any railroad as it is necessary to secure the permission of the Interstate Commerce Commission.

The members of the Committee on Locomotive Construction are: H. H. Lanning (chairman), mechanical engineer, A. T. & S. F.; E. L. Bachman (vice-chairman), general superintendent motive power, Penna.; D. R. Calleri, mechanical engineer, Sou. Pac.; Frank Williams, chief mechanical engineer, Can. Nat'l.; J. E. Ennis, engineering assistant, N. Y. C.; J. B. Blackburn, mechanical engineer, C. & O.; K. Cartwright, chief mechanical engineer, N. Y., N. H. & H.; L. H. Kueck, assistant chief mechanical officer, Mo. Pac.; G. W. Bohannon, assistant chief mechanical officer, C. & N. W.; A. G. Hoppe, general superintendent locomotive and car departments, C. M. St. P. & P., and C. M. House, superintendent motive power and equipment, Alton.

Discussion

In discussing fire protection for Diesel locomotives, one member referred to the need for careful housekeeping and to the problem of taking care of several hundred feet of hose. One objection he had to the report was the requirement for 200 gal. of water, which would reduce the water-carrying capacity now needed for other purposes. He believed that 200 gal. was too severe as a minimum requirement.

A member reviewed the disastrous Diesel locomotive fires that had occurred on his railroad and mentioned the difficulties of determining the origin. He believed that it would be necessary to find out how the fires started before a decision could be made as to the fire-protection equipment needed.

A suggestion was made that the committee recommend the location of the fire-fighting equipment on the locomotive because its location would make a difference in its availability when needed.

Another member reviewed the Diesel cost figures presented by Mr. Hoppe during the meeting, which were not included in the printed report. He showed that a comparison of the cost figures presented indicated that a 4,000-hp. locomotive had a lower per-mile operating than a 2-000-hp. locomotive and therefore doubted the accuracy of the figures. In reply, Mr. Hoppe said that he doubted that the figures obtained were worth very much.

Concern was expressed about the high axle loads of Diesel locomotives and the opinion was voiced that loads should be reduced to 50,000 lb. per axle.

Another problem discussed was the diversity of traction motors, the non-interchangeability making it necessary to maintain a larger stock of parts.

John M. Hall, director, Bureau of Locomotive Inspection, Interstate Commerce Commission, called attention to the poor visibility from the cabs of many large designs of new steam locomotives and suggested that in the future special attention should be given to this particular phase of locomotive design in order that enginemen be provided with maximum visibility.

In discussing the matter of the welded locomotive boiler, Mr. Hall referred to the paper presented by him at the recent spring meeting of the American Society of Mechanical Engineers in Chattanooga which set forth the position of the Bureau in the matter of construction of welded boilers. Mr. Hall emphasized that the Bureau has not granted any blanket approval of welded boiler construction and that the railroads must make application for permission to build or have built boilers of that type, filing with the application detailed drawings and specifications. Permission will be granted in individual cases only after such application has been filed. The railroads must not build welded boilers in their own shops, said Mr. Hall, without having first made application for permission to do so, for such shops are seldom equipped with the necessary facilities for meeting the requirements of the welded type of construction.

In discussing the seal welding of staybolts, Mr. Hall directed attention to the fact that the permission to perform such work is in the case of new work only and that no welding is permitted in connection with the removal and replacement of staybolts, as a result of defect or otherwise.

(*The report was accepted and its recommendations ordered referred to letter ballot.*)

Report of the Committee on Material Specifications

Withdrawal of certain piping and high-chrome steel specifications recommended—Separation of carbon and carbon-silicon steel specifications recommended—Changes recommended in specifications for forgings

The committee reviewed all of the A. A. R. material specifications, and as a result of this review submitted the following recommendations as to changes and revisions:

The committee recommended that the present specifications M-111, and emergency specifications EM-111, for furnace-welded, electric resistance-welded and seamless-steel pipe, be rescinded from the Manual, and replaced with a sheet to the effect that the A. A. R. requirements for this material are to be covered by A. S. T. M. specifications: A-53 for Welded and Seamless Pipe, A-135 for Electric Resistance Welded Pipe, and A-120 for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless-Steel Pipe for Ordinary Use. This action was recommended as railroads are comparatively small users of this type of pipe, and it would be to their commercial advantage to follow along with general accepted standards.

The committee recommended that the following change in specifications M-114, sec. 16(a), for carbon-steel helical springs be submitted to letter ballot: Proposed Form —The ends of the bars shall be properly tapered to give *the finished springs at each end* a firm bearing, *which shall be square with the axis of the helix within 3/8 in. per foot of free height.*

The points of the bar shall be in approximate contact with the adjacent coil and shall not protrude beyond the outside diameter of the springs.

[Specification M-115-45 for carbon and carbon-silicon steel for boilers and fireboxes for locomotives, stationary boilers, and other pressure vessels has been recommended for revision by separating this specification into M-115-46 for carbon steel, and M-128-46 for carbon-silicon steel. The two revisions recommended to be submitted to letter ballot are shown as Exhibit B and Exhibit C respectively. These two exhibits, along with Exhibit A, and D to G, incl., prepared by the committee are not included in this abstract because of lack of space.—Editor.]

The committee recommended that Specifications M-125-44, for machine bolts and nuts be revised so as to bring the requirements into conformity with present practices of the manufacturers and type of product being produced, and that the revised specifications M-125-46, Exhibit D, be submitted to letter ballot.

Forgings

Editorial changes have been approved by the committee in the following sections of Specifications M-126-45 for carbon-steel forgings, and are recommended to be made in the next printing of these specifications: Sec. 5(a), Sec. 13(a) Table III, Sec. 15(c), and Sec. 16(a).

Editorial changes have also been approved to be made in the next printing of Sec. 6(b) and Sec. 13(a) of specifications M-127-45 for alloy steel forgings. A new section, 6(c), has been added, and reads as follows:

In bored forgings, the diameter of the holes shall be a matter of agreement between the manufacturer and the purchaser. In order to provide adequate quenching, the diameter of the hole shall be not less than 20 per cent of the outside diameter of the forging.

High-Chrome Steel

[Four specifications for the use of high-chrome steel in nitric-acid tank cars were recommended by the committee for withdrawal from Sec. A of the manual in their entirety because of the very limited amount of construction of cars using these alloy materials. The specifications to be submitted to letter ballot are: M-151-29 for rivet material, M-152-29 for tubing, M-153-29 for tank plates, and M-251-29 for castings for valves. The members of the Tank Car Committee concurred in this recommendation.—Editor.]

Miscellaneous Material

Modifications of the requirements of the 1945 issue of specifications M-201-45 for steel castings have been approved by the Committee and are being attached, identified as Exhibit E, with recommendations that they be submitted to letter ballot.

The committee recommended that revised Specifications M-306-38 for welded wrought-iron pipe bringing the requirements in conformity with present-day practices, attached to this report, identified as Exhibit F, be submitted to letter ballot.

Revised specifications M-605-38, and EM-605-44 for Steam and Hot Water Hose have been prepared and approved. The committee recommended that the emergency

specifications EM-605 be rescinded and revised specifications M-605-46, attached to this report as Exhibit G, be submitted to letter ballot.

Committee Members

The members of the Committee on Specifications for Materials are: T. D. Sedwick (chairman), engineer of tests, C. R. I. & P.; H. G. Miller (vice-chairman), mechanical engineer, C. M. St. P. & P.; C. B. Bryant, chief engineer, Technical Board, Wrought Steel Wheel Industry; F. Zeleny, engineer of tests, C. B. & Q.; H. G. Burnham, engineer of tests, Nor. Pac.; H. P. Hass, director of tests and research, N. Y. N. H. & H.; J. R. Jackson, engineer of tests, Mo. Pac.,; L. B. Jones, engineer of tests, Penna.; W. R. Hedeman, engineer of tests, B. & O.; W. F. Collins, engineer of tests, N. Y. C.; W. Bohnstengel, engineer of tests, A. T. & S. F.; and R. McBrian, engineer standards and research, D. & R. G. W.

Discussion

Howard Lanning, A. T. & S. F., called attention to that part of the report covering firebox and flange steel and said that the maximum allowable percentage of copper is too high and may cause trouble due to cracking of flanges. He said that both copper and residual alloys should be further restricted. Mr. Lanning also objected to the tables on pages 10 and 17 of the committee report showing the maximum permissible overweight in plate thicknesses which will tend to prevent building locomotive boilers large enough to meet modern requirements and yet keep within necessary weight limitations.

(The report was approved except for the three items mentioned and necessary recommendations ordered referred to letter ballot.)

Report on the Loading Rules

Special supplement to loading rules on the movement of machinery prepared and the change from war to peacetime production expected to require further revisions

The annual report of your committee for the year 1945 covers all matters which have come before the committee since the last annual report was presented to the General committee in June, 1945. A number of changes in the various rules have been made to provide better and safer securement, past experience having shown this action to be necessary from a transportation safety standpoint.

Your committee prepared a special supplement covering the loading of machinery. It was deemed essential that such action be taken in view of the large quantity of machines of various types that would be shipped to all parts of continental North America from plants manufacturing war material after these installations were dismantled at the end of the war. This special supplement abrogates the present figures and specifications covering machinery in the Open Top Rules. This pamphlet was published and issued on August 15, 1945, and is effective until rescinded.

Revised or new specifications and drawings covering certain forest products, steel products and automotive products have been prepared and submitted to the industry for concurrence. Anticipating their approval, these revisions and additions have been included in this report.

With the end of the war your committee is now faced with the transition period from war to peace time production of major industry, and we anticipate many new problems in loading methods, which will undoubtedly necessitate further revision in the loading rules to meet the changing conditions.

The following changes in the rules have been approved and will become effective with the next issue of the rules.

Rule 4

Revised to read:

(A) The weight of the load on a car must not exceed the load limit stenciled on the car.

(B) When the load is lapped or staggered between truck centers and covers about the full length of car and the weight of load does not exceed the stenciled nominal capacity of the car, the following tables need not apply.

(C) The weight of material loaded between truck centers and ends of car must not exceed 30 per cent of stenciled limit (i.e. 15 per cent each end).

(D) The percentages of stenciled load weight limits, as shown below, must not be exceeded for loads located between truck centers, measured lengthwise of car, unless car owner has otherwise designated, by note, in the Official Equipment Register that these percentages may be changed.

1. Flat cars with both fish-belly center and fish-belly side sills.

18 ft. or less	75 per cent
Over 18 ft. to truck centers	100 per cent

2. Flat cars not equipped with both fish-belly center and fish-belly side sills.

10 ft. or less	66.6 per cent
Over 10 ft. to 24 ft.	75. per cent
Over 24 ft. to truck centers	90. per cent

3. Drop-end gondola cars.

18 ft. or less	75 per cent
Over 18 ft. to 24 ft.	87 per cent
Over 24 ft. to truck centers	100 per cent

4. Fixed-end gondola cars.

10 ft. or less	40 per cent
Over 10 ft. to 20 ft.	50 per cent
Over 20 ft. to 24 ft.	60 per cent
Over 24 ft. to truck centers	75 per cent

(E) When the length of load is less than the distance between truck centers, and the load is not located in the center of car, the center of load weight must not be nearer to either truck center than shown below:

When load weight is reduced to per cent	Location of center of load weight between truck centers
40	Any place
50	Any place
60	One-sixth distance
66.6	One-fourth distance
75	One-third distance
87	Three-sevenths distance
90	Nine-twentieths distance

(F) The distance between crosswise bearing pieces (center to center) underlapped or staggered portion must be placed so as to prevent excessive concentration of weight over specified spaces shown in the above tables.

(G) Bearing pieces, lengthwise of car, of suitable strength and length to provide for extended distribution of weight over the specified spaces, shown in the above tables, may be used.

(H) When crosswise bearing pieces are used, the distance between the outside bearing pieces, (center to center) must not be less than the minimum distances specified in the above tables.

Reason: Completely revised and clarified to provide for better understanding.

Rule 5

First paragraph is revised to read: "The weight of load on one truck must not exceed one-half of the load weight limit stenciled on the car. In case of doubt, this must be verified by weighing." *Reason*: To eliminate cross reference to Rule 4.

Rule 8

Section "B" is revised to read: "Sufficient clearance must be provided, when loading, to maintain 4-in. clearance below overhanding portion of load and any part of idler car which load may contact."

Reason: To clarify the intent.

Section "D" is revised to read: "When a gondola car is used for an idler, the width of overhang, as shown in Tables 1 and 2, must be reduced by an amount equal to the difference between 12 ft. and the minimum inside width of the gondola car, as per following example:

Length of load (Table No. 1), ft.-in.	60-0
Length of car used (Table No. 1), ft.-in.	46-0
Assumed width of car used, ft.-in.	8-9
Arbitrary figure for all loads, Rule 8, Sec. (d), ft.-in.	12-0
Amount of reduction, Rule 8, Sec. (d) = 12 ft. 0 in. – 8 ft. 9 in. = 3 ft. 3 in.	
Allowable width of load (Table No. 1), flat car as idler, ft.-in.	7-0
Allowable width of load, Rule 8, Sec. (d), gondola car as idler = 7 ft. 0 in. – 3 ft. 3 in. = 3 ft. 9 in."	

Reason: To clarify the intent.

Rule 10

Paragraph "C" is revised to read: "Stakes 4 in. by 5 in. must be tapered to fully fit into and extend at least 4 in. below the stake pockets. Smaller stakes must be tightly secured in the stake pockets, with wedges driven downward into stake pockets and secured to stakes with nails. When no other than the top ties, or none, are used on stakes, the stakes must extend 4 in. below stake pockets, with one 40-D nail driven into the stake directly below and with head even with outside of the stake

pocket. When metal stakes do not accurately fit the stake pockets, they must be wedged or built up to fill the pockets; also, secured so they cannot slip through the pocket. Stakes may be placed either in or out of stake pockets on inside of gondola cars with sides 30 in. high or over, provided they rest on car floor and are securely wedged to car sides by lading."

Reason: To again require use of a 40-D nail in bottom of stakes where intermediate cross ties are not used.

Rule 15

Fourth paragraph of Section (b) is revised to read: "Metal fillers sufficient to provide a suitable radius must be used to protect bands and wires at stake pockets, slotted holes in car sides, and at all points on the car or lading having sharp edges."

Reason: To eliminate mention of the definite radius previously specified.

A note is added after Paragraph (e) to read: "To prevent mutilation of cars, exacting efforts must be made to refrain from cutting unnecessary holes or slots, or to confine them to the minimum number and dimensions, required to secure the load."

Reason: To prevent undue mutilation of cars.

New third paragraph added to Section (g) to read: "The welding of high-tension bands is prohibited."

Reason: To prohibit the welding of high-tension bands.

Rule 16

The heading is revised to read: "Loads on One Car Overhanging One End or Both Ends of Car—Length of Material—Width of Overhanging Portion of Load—Allowable Weight of Load. Tables 1 and 2."

Reason: To clarify the intent.

Rule 18

The heading is revised to read: "Loads on Two or Three Cars—Width, Height and Overhang. Tables 3 to 35, Inclusive."

Reason: To clarify the intent.

[The remainder of the report was devoted to new figures, deletions and to the details of revisions made either to the drawings or the text accompanying the drawings. Revisions were made to Figs. 2, 5, 5-A, 6-A, 20, 27, 27-A, 27-B, 29, 30, 32, 35-A, 40-A, 44, 51, 51-A, 52, 63, 63-A, 71-A, 75, 77, 111, 112, 170, 209-B. New Figs. 75-D, 75-E, 206 and 207 were added, the first two figures covering the loading of cable reels and the latter two covering the loading of four-wheel and six-wheel trucks, respectively. Figs. 186, 187 and 188 were deleted because the loading of machinery is covered fully in the special supplement issued August 15, 1945.

In addition the committee listed 22 subjects under consideration which will entail the revision of present figures and specifications or the formulation of new methods of loading. These included four on forest products; eight on steel products; three on farm, wrecking and excavating machines; two on glass products; four on stone, concrete and clay products, and one on automotive products.—Editor]

The members of the Committee on Loading Rules are: W. B. Moir (chairman), chief car inspector; Penna.; C. J. Nelson (vice-chairman), superintendent of interchange, Chicago Car Interchange Bureau; H. F. Lyons, superintendent car department, Reading; T. W. Carr, superintendent rolling stock, P. & L. E.; A. H. Keys, assistant superintendent car department, B. & O.; H. H. Golden, supervisor A. R. A. Interchange and Accounting, L. & N.; H. J. Oliver, assistant superintendent motive power (car), D. T. & I.; F. A. Shoulty, assistant superintendent car department, C. M. St. P. & P.; G. D. Minter, division car inspector, N. & W., and F. Fahland, mechanical engineer, U.P.

(*The report was accepted.*)

Report of Tank-Car Committee

200 applications for approval of designs and 103 applications for alterations in, additions to, or conversions of tank cars—No formal meeting held

During the past year the committee was called upon to give consideration to 200 dockets and applications for approval of designs as follows: Seventy-three covered designs, materials and construction of 1,348 new shipping containers, for mounting on new cars or for replacement on existing cars; three covered the construction of 14 multiple-unit cars to be used for the transportation of 15 Class I.C.C.-106A500 type one-ton containers each; one covered the construction of one car structure for the mounting of an existing Class I.C.C.-103-A tank-car tank; and 103 covered alterations in, additions to, or conversions and reconditioning of 2,557 existing tank cars or shipping containers.

Substitutes for Tank Cars

Because of the shortage of tank cars during the war emergency several expedients were resorted to. Among these were the following:

B. & O. box car 390000 equipped with four steel-lined wooden tanks and the necessary fittings for loading and unloading, and assigned to Diesel-oil service between Baltimore, Md., and Washington, D. C., was first loaded February 23, 1943, and made a total of 88 trips with loads ranging from 9,777 to 12,416 gallons, the majority closely approximating 12,000 gallons. Its last trip was made September 11, 1945. Standard tank cars then being available, tanks and fittings were removed on November 1, 1945, and this car restored to regular service.

B. & O. box car 390050 equipped with five corrugated steel tanks, having a total capacity of 12,500 gallons, and such fittings as were required to load and unload them, was assigned to Diesel-oil service between Canton, Md., and Washington, D. C. It was first loaded on May 6, 1943, made a total of 56 loaded trips, and, after removal of tanks and fittings, was restored to regular service on March 6, 1945.

L.C.L. Corporation air-activated cement containers were regularly handled on gondola cars equipped with fittings to prevent shifting or rotation of the containers in transit. After being altered, 116 car sets of containers were placed in service assigned to the handling of fuel oil and other petroleum products having a flash point above 80 deg. F. Seventy-four of the cars mounted five containers each, with an aggregate capacity of 9,700 gallons per car, and 42 cars accommodated six containers, with these providing a capacity of 11,166 gallons per car. These cars were assigned to service between Destrehan, La., and Chelsea, Mass. For the period for which they were used they transported and delivered approximately 1,520,000 gallons of fuel oil per month. Their last loading was in August, 1945, after which the containers were reconverted for use in their normal service.

Only minor difficulties were encountered in the use of any of the substitutes mentioned while they were used for transporting petroleum products.

Changes in I. C. C. Regulations

Upon recommendation of the committee, concurred in by the Bureau of Explosives, the Interstate Commerce Commission authorized the equipping, for experimental purposes, of a total of 25 specification ICC-103-B tank cars with porous-carbon-cylinder safety vents. Upon further recommendation of the committee, concurred in by the Bureau of Explosives, and following the satisfactory completion of 270 trips, the commission authorized amendment of specification ICC-103-B and ICC-103-B-W to provide authority for equipping cars of these classes, without limit except for lading services indicated, with safety vents of the porous-carbon-cylinder type.

Following report received from builders of specification ICC-106A500 forge-welded ton-containers of their inability to secure forge-welded barrel sections, accompanied by recommendation that this specification be amended to authorize barrel sections of ton-containers to be fabricated by fusion welding, it was agreed there was necessity for modification of the specification as proposed. The recommendations of the committee, concurred in by the Bureau of Explosives, were presented to the commission. By order dated April 19, 1946, the commission amended its specifications 106A500 to authorize the further use of fusion-welding as proposed in the construction of tanks of this type, and requiring that any having fusion-welded longitudinal joints in the barrel sections be steel-stamped ICC-106A500X. The Gen-

eral Committee has approved modification of A.A.R. requirements of A.A.R. Tank Car Specification ICC-106A500, to supplement the I.C.C. amendment of its specification, to provide details not inconsistent with I.C.C. requirements.

While the committee as a whole has held no meetings since its report of June 12, 1945, its members have been called upon frequently to serve on numerous subcommittees. These members' reports and recommendations have been extremely helpful to the committee in disposing by correspondence of the various proposals, applications and dockets requiring its attention.

The members of the Committee on Tank Cars are: F. Zeleny, chairman), engineer of tests, C. B. & Q.; R. D. Bryan (vice-chairman), mechanical assistant, A. T. & S. F.; W. C. Lindner, motive-power inspector, Penna.; A. G. Trumbull, general mechanical engineer, C. & O.; I. R. Schuster, engineer car construction, Sou. Pac.; L. R. Christy, superintendent car department, Mo. Pac.; D. S. Clark, administrative assistant to head, School of Mechanical Engineering, Purdue University; J. J. Root, Jr., vice-president, Union Tank Car Co.; R. T. Baldwin, secretary, the Chlorine Institute, Inc.; H. J. Gronemeyer, supervisor car equipment, E. I. du Pont de Nemours & Co.; R. W. Thomas, manager, chemical products department, Phillips Petroleum Co., and G. W. Thomas, master car builder, Deep Rock Oil Corp.

(*The report was accepted.*)

Arbitration Committee Report

Recommendations include the elimination of obsolete types of retaining valves, a prohibition on the use of spliced air hose, and the methods of handling and settling for badly damaged cars under all conditions.*

During the year Cases 1812 to 1818, inclusive, have been decided and copies forwarded to the members.

With the approval of the General Committee, the effective dates of the requirements in Rule 3 with respect to metal badge plates and bottom-rod and brake-beam safety supports are extended to January 1, 1947.

With the concurrence of the Committee on Couplers and Draft Gears, it is recommended that the effective dates of Rule 3 requirements prohibiting acceptance from owners of cars equipped with couplers having 5-in. by 5-in. shanks and cars equipped with certain couplers having 5-in. by 7-in. shanks, be extended to January 1, 1948.

Upon the recommendation of the Committee on Brakes and Brake Equipment and in order to eliminate obsolete types of retaining valves, it is recommended that Paragraph (a-1-b) of Rule 3 be modified to require pressure-retaining valves of not less than the A. A. R. standard three-position double-spring type, including spring caps designed to prevent the distortion of springs, on all cars received from owners on and after January 1, 1949.

With the concurrence of the Committee on Brakes and Brake Equipment, Rule 57 is modified to prohibit the use of spliced air hose on cars in interchange service on and after January 1, 1947.

With the concurrence of the Committee on Wheels, it is recommended that paragraph (b) of Rule 82 be modified to provide additional conditions under which a mate wheel with brake-burn cracks or comby spots may be scrapped when removed from service in connection with a defective axle or the other mate wheel.

Modification of Sub-Section 1, Section A of Rule 112 is recommended, to provide a method of handling and a complete basis of settlement for badly damaged cars returned to owner under all conditions.

The committee does not feel that any of the modifications included in its report necessitate submission to letter ballot.

Proposed revisions of Freight car Rule 2 and Passenger car Rule 2 covering the acceptance in interchange of cars using compressed or liquefied gas as fuel for heating, lighting, refrigeration or air conditioning, were submitted to letter ballot in Circular DV-1090 dated August 24, 1945, and approved.

However, because of the substantial negative vote and the reasons therefor, modification of these rules was held in abeyance by the General Committee and the matter referred to the committee for study and recommendation. The report, as prepared and transmitted to the General Committee, is published as a part of that committee's report.

Attention is again directed to the fact that the Arbitration Committee will not consider questions under the Rules of Interchange unless submitted in the form of Arbitration Cases as per Rule 123.

Rule 3

The committee recommends that effective dates for various requirements in the present rule, as listed below, now set at January 1, 1947, be extended to January 1, 1948:

Section (b), Paragraph (9)—Braking power: braking ratio.

Section (c), Paragraph (10)—Couplers having 5-in. by 5-in. shanks.

Section (c), Paragraph (11)—Couplers having 5-in. by 7-in. shanks.

Section (c), Paragraph (12)—Couplers, bottom rotary operated, not equipped with assembled riveted-type lock-lift lever and toggle.

Section (t), Paragraph (10) — Tank Cars: metal placard holders.

Section (u), Paragraph (4)—Class E-3 cars not to be accepted from owner.

Reason: The present situation justifies these extensions.

The Committee recommends that Paragraph (a-l-b) of this rule be modified, as follows:

Proposed Form: (a) (1-b) Air brakes. Pressure-retaining valves of not less than the A. A. R. standard three-position double-spring type, including spring caps designed to prevent distortion of springs, required on all cars built new or rebuilt, and on all cars equipped with AB brakes in place of K brake equipment, on or after January 1, 1943. *Effective January 1, 1949, the foregoing requirement will apply to all cars.* From owners.

Reason: To eliminate obsolete types of retaining valves, as recommended by the Committee on Brakes and Brake Equipment.

Rule 4

The committee recommends that the note following Paragraph (f-3) of this rule be modified effective August 1, 1946, as follows:

Proposed Form: Note.—Bent metal side and end sheets are cardable only when [bent] in connection with cardable bent posts, stakes, braces, metal top chord angles, *side and end sills,* or their substitutes.

Reason: To eliminate the apparent misunderstanding that sheets bent inwardly, when associated with cardable side and end sills, are not also cardable.

The committee recommends that Paragraph (g-1) of this rule be modified in the next supplement as follows:

Proposed Form: (g) (1) All cars.—Metal end sill, damaged in unfair usage, when its removal from car is necessary for repairs [to end sill or to;] *or when necessary to repair on or off car in connection with* other associated unfair usage damage [of car].

Reason: To clarify the intent.

The committee recommends that Paragraph (g-2) of this rule be modified, effective August 1, 1946, as follows:

Proposed Form: (2) All cars.—Metal side sills, [extending from bolster to end sill only] if *both* flange *and* [or] web *are* [is] bent in excess of 2½ inches.

Reason: To provide specific limitation of responsibility for damage to full length side sills.

Rule 32

The committee recommends that the note following Paragraph (10-k) of this rule be modified, as follows:

Proposed Form: Note — The handling line is responsible and defect cards should be issued for damage to cars resulting from hot lading having been placed therein, or from open flames used to thaw out frozen lading to facilitate unloading, where parts of cars are damaged to the following extent by overheating:

Reason: To clarify the intent.

* Brackets indicate deletions from present rules. Italics indicate additions to present rules.

Rule 56

The committee recommends that Items 6 and 7 of this rule be modified, as follows:

Proposed Form: 6. Loose or defective fittings, either or both ends of hose [, or at joiner on spliced hose.]

7. End of tube 3/8 inch or more from shoulder on either nipple or coupling [or joiner on spliced hose.]

Reason: Account of change in Rule 57.

Rule 57

Recommended that the first paragraph of this rule be modified:

Proposed Form: Rule 57. Cars not equipped with A. A. R. Standard 1 3/8-in. air brake hose, [or spliced hose per A. A. R. Specifications.] For label [for new hose,] see below.

Reason: To prohibit the use of spliced air hose on cars in interchange service after January 1, 1947. This recommendation has the concurrence of the Committee on Brakes and Brake Equipment.

Rule 69

The committee recommends that a new paragraph (g) be added to this rule, effective August 1, 1946, to read as follows:

"(g) It is permissible to mount second-hand experimental cast-iron wheels of 1942 design having changed flange and flange-supporting brackets, marked 'A. A. R. X.' and cast subsequent to 1941, with second-hand A. A. R. Recommended Practice single plate bracketed cast-iron wheels."

Reason: The mating of such wheels has been approved by the Committee on Wheels.

Rule 70

Recommended that Section (e) of this rule be modified, effective August 1, 1946:

Proposed Form: (e) The substitution of one-wear wrought-steel wheels for multiple-wear wrought-steel wheels, cast-steel wheels or steel-tired wheels does not constitute improper repairs, except on passenger equipment cars, freight cars equipped for passenger train service, or freight cars of over 70-ton capacity, *in which cases the principles of Interpretation No. 4 to Rule 98 apply as to charges and credits and issuance of defect card.*

Reason: To provide for charges and credits for improper wheel substitutions.

Rule 82

The committee recommends that Paragraph (b) of this rule be modified, effective August 1, 1946, as follows:

Proposed Form: (b) Brake burn *and comby:* Cast-iron wheels removed from service account condition of axle or mate wheel shall be classed as scrap: *(1)* If the brake-burn crack is 2 inches or more in length across the tread; [Cast-iron wheels removed from service account condition of axle or mate wheel and found to be comby shall be classed as scrap if such] *(2) If more than three brake-burn cracks are 1¾ inches or more in length across the tread; (3)* If comby spot is broken out so as to leave a continuous cavity one inch or more in length measured circumferentially on the tread; *(4) If more than three comby spots having continuous cavities one inch or more in length measured in any direction on the tread; (5) If any combination outlined in Items (2) and (4) totals four or more.*

Reason: Wheels having such defects are considered as unfit for reapplication and are being scrapped. The Committee on Wheels concurs in this modification.

Rule 98

The committee recommends that a new Paragraph (6) be added to Section (c) of this rule, effective August 1, 1946, to read as follows:

"(6) Experimental cast-iron wheels of 1942 design having changed flange and flange-supporting brackets, marked 'A. A. R. X.' and cast subsequent to 1941, take the same status as the A.A.R. Recommended Practice cast-iron wheels. Such serviceable second-hand wheels may be mounted with second-hand single plate bracketed wheels." *Reason:* To provide for charges, credits, substitutions, etc., of 1942 design cast-iron wheels, as recommended by the Committee on Wheels.

Rule 101

The committee recommends that Item 2 of this rule be modified as follows:

Proposed Form: 2. Air-brake hose, A. A. R. Standard [or spliced per A. A. R. Specifications], average credit for fittings for same. *Reason:* The use of spliced air hose on cars in interchange service is prohibited on and after January 1, 1947.

Rule 107

The committee recommends that the first note following Item 301 of this rule be modified in the next supplement, as follows:

Proposed Form: Note.—Metal weight involved is total weight of all metal parts in both body and trucks, including axles, wheels [, complete couplers] and journal bearings. *Reason:* To harmonize with change in Section (g) of Rule 120.

Rule 112

The committee recommends that Sub-Section 1 of Section A of this rule be modified, effective August 1, 1946, to read as follows:

Rule 112. Section A.—Rebuilt and Non-Rebuilt Cars:

1. (a) When a foreign freight train car is destroyed or badly damaged under any condition for which the handling line is responsible, the owner upon request of the handling line, shall promptly furnish a statement showing its A. A. R. depreciated value.

1. (b) If it is estimated by the handling line that the car is not damaged to the extent of its A. A. R. depreciated value less salvage, it may—

(1) Make complete repairs at its own expense, or

(2) Make such repairs at its own expense as may be necessary to safely move the car home on its own wheels, in which event a defect card bearing notation "Home for Repairs" shall be attached covering the unfair usage damage, or

(3) Send car home with defect cards attached, loaded on another car, and assume the cost of loading, $25.00 for unloading, and transportation to home line. Car owner must be consulted as to the shop to which he desires the car sent and will assume the cost of transportation on own line.

1. (c) If it is estimated by handling line that the cost of repairs will equal or exceed the A. A. R. depreciated value less salvage, and, therefore, it prefers to settle for the car at its depreciated value—

(1) It shall, within 15 days ofter receipt of depreciated value statement, so advise the owner and furnish a list of the major items of damage.

(2) Within 10 days after receipt of this information, the owner must notify handling line whether he desires to have the car repaired or to have the settlement made on depreciated value basis. In the latter event the owner will indicate the items of material, if any, to be recovered under provisions of Section J of this rule.

(3) If the owner requests that the car be sent home for repairs, such request shall constitute authority for handling line to make temporary or partial repairs as may be necessary at a cost not to exceed $50.00, chargeable to owner, for movement of the car home on own wheels. If the car cannot be so conditioned for this amount and owner does not desire to authorize a greater expenditure, the car shall be sent home loaded on another car or cars (preferably one car), in which event the handling line shall not charge the owner the cost of loading nor transportation over its own line. Car owner shall, however, assume transportation costs on his line, or any intermediate line, and also cost of unloading.

(4) Upon arrival home, should the owner elect to retire instead of repair the car, he shall pay the handling line $50.00 for loading, plus cost of transportation over the handling line (or latter's proportion where a through rate is involved), and the owner may render a bill in accordance with Rule 94.

1. (d) (1) If the car is returned to the owner, either upon his authorization or at the option of handling line, with defect card attached covering damage, upon completion of repairs, a bill may be rendered against the handling line on the basis of the Interchange Rules; however, bill may not exceed the A. A. R. depreciated value less net salvage. The salvage value is the sum obtained by multiplying the light weight in pounds by one-half cent and then deducting an arbitrary dismantling cost of $30.00. Separate bills shall be rendered in such cases.

Note 1.—In cases where the handling line sends car home on the authority of the owner and is satisfied the cost of repairs to the damage exceeds the depreciated value less net salvage, it should, upon completion of repairs, authorize a bill without requiring submission of detailed repair cards.

Note 2.—A bill for repairs versus the handling line shall not exceed the depreciated value of car less salvage, but if the cost of repairs is less than the amount, the car owner may include in bill the expense

incurred for temporary and partial repairs, or transportation charges, or proportion thereof which will bring the total bill up to the depreciated value less salvage.

Reason: To provide a method of handling and a basis of settlement for badly damaged cars returned to owner under all conditions.

Rule 120

The committee recommends that first paragraph of Section (g) of this rule be modified in the next supplement, as follows:

Proposed Form: (g) If owner authorizes dismantling, handling line shall allow credit at A. A. R. second-hand value for wheels and axles in serviceable condition for reapplication under the rules. *Unserviceable wheels and axles and all journal bearings shall be credited at scrap prices shown in Rule 101. All other metal parts shall be credited at one-half cent per pound. From the total credit, deduct labor cost of dismantling, per Item 301 of Rule 107.* However, owner shall have the privilege of having returned serviceable cast-steel truck side frames, metal truck and metal body bolsters, metal draft arms, friction draft gears, cast-steel yokes, metal ends, AB brake equipment, auto loading devices, and refrigerator car circulating fans; also tanks, special castings and valves of tank cars; by attaching to the statement of estimated weights a list of such parts with full shipping instructions; such parts to be billed at [A. A. R. scrap value] *one-half cent per pound* plus 7 per cent for handling, f.o.b. point of shipment.

Reason: To clarify the intent.

Passenger Rule 2

The committee recommends that the first paragraph of this rule be modified in the next supplement, as follows:

Proposed Form: Rule 2. Cars, loaded or empty, offered in interchange with defects for which owner is responsible, provided they are equipped with air brake, air signal and steam heat train line having end steam valves and otherise meet the requirements of receiving line as to *type of construction,* safety and clearances, must be accepted, with the following exceptions:

Reason: To clarify the intent with respect to cars of wooden superstructure or composite truck construction.

The committee recommends that the effective date of Paragraph (e) of this rule, with respect to equipping all-steel underframe cars with cardboards of suitable receptacles for accommodation of defect and joint evidence cards, and effective date of Paragraph (f) covering the application of brakeshoe spark shields to passenger train cars having underneath exposed wood parts over the wheels, both requirements now being set at January 1, 1947, be extended to January 1, 1948.

Reason: The present situation justifies these extensions.

The members of the Arbitration Committee are: J. P. Morris (chairman), general mechanical assistant, A. T. & S. F.; J. A. Deppe (vice-chairman), superintendent car department, C. M. St. P. & P.; W. N. Messimer, assistant superintendent of equipment, N. Y. C. System; L. Richardson, mechanical assistant to vice-president and general manager, B. & M.; G. E. McCoy, assistant chief of car equipment, Can. Natl.; M. R. Reed, assistant chief motive power (car), Penna. System; M. F. Covert, general superintendent equipment, General American Transportation Corporation, and J. J. Root, Jr., vice-president, Union Tank Car Company.

(The report was accepted.)

Report of the Committee on Geared Hand Brakes

Operation and standardization are the major objectives of new committee—Grease specifications and change in lubrication requirement proposed—Credit allowance for defective parts considered

In initiating the program for the certification of geared hand brakes two major objectives were in mind. One was the combination of the features of ample braking power, sturdy construction and convenience of manipulation; the other purpose was to reduce insofar as possible, the number of different brakes of a type that would be subject to interchange handling.

As of May, 1946, a total of 12 vertical-wheel geared hand brakes and 4 horizontal-wheel have been tested and approved. Other applications have been received for which tests are being arranged.

In order to better control the number of approved brakes through this procedure, the number of hand brakes of each type from any one manufacturer must necessarily be limited and this feature is being carefully watched as applications are received.

Revision of Specifications

In providing for the testing of horizontal-wheel geared hand brakes it was necessary to make some changes in the laboratory procedure from that followed in the handling of the vertical brake. This change was of such a character as to require revision of the specification for horizontal-wheel brakes. The suggestion for this alteration was contained in letter ballot Circular DV-1096 which is now in the hands of the Association for consideration.

There are certain designs of small groups of special cars where due to the construction none of the approved designs of geared hand brakes can be used. To provide for such cases it is proposed to include a provision that, in such cases, brakes applied shall meet requirements of the specification and, after A. A. R. test and approval, be marked AAR-1942-S (the letter "S" to signify "Special"). Such special designs will not be listed among the types approved for unlimited application and will not be accorded the same consideration as regular approved types in interchange accounting, substitutions, etc.

If this provision is approved, Interchange Rule 3 will require modification to provide for the application of such brakes to new cars. This will be referred to the Arbitration Committee.

It is recommended that the specifications for geared hand brakes be revised, for identification purposes, to specify that all approved brakes must be plainly stamped or have cast on the face of the casing the symbol "AAR-1942" in letters at least ¾ in. in height.

Lubrication

The committee recommended that A. A. R. Interchange Rule 61 be amended to make the lubrication requirement mandatory by deleting the words "if necessary". By such means, all geared hand brakes will be lubricated at least every three years.

[The committee made two suggestions for conforming with their lubrication program. For hand brakes where oil lubrication is preferred, any good grade of car oil was recommended. Where Alemite or similar fittings are provided it recommended a grease with the following characteristics: soap (calcium)—12 per cent; graphite—12 per cent; mineral oil—72 per cent; water, fatty acids and free alkali—4 per cent; penetration—300 to 355; and a melting point of 200 deg. F, plus or minus 5 deg. F. —Editor]

Credit for Defective Brakes

There has been referred to your committee a subject that has been before the Arbitration and Price Committees relative to recommending an average credit allowance for defective (or inoperative) geared hand brakes removed on foreign lines.

Observations indicate that where it is the practice to have defective hand brakes returned, the condition of such brakes varies over a wide range; therefore your committee does not consider any credit that might be established would be a fair representation of the value of the brakes. It would be of value to owners making a practice of having hand brakes returned, if the handling line was required, through a revision of Interchange Rule 17, more definitely to indicate the condition of the disabled hand brake when reporting them to owner. This is offered as a suggestion to the Arbitration Committee.

It is the opinion of your committee that where car owners are interested in reclaiming geared hand brakes removed from their cars on foreign railroads, Interpretation of B-5 of Interchange Rule 17 provides the most reasonable and equitable means of handling at the present time.

Recommendations

The committee recommended that the following items be referrel to letter ballot:

1—That manufacturers of geared hand brakes be limited to four designs of vertical-wheel type, two designs of horizontal-wheel type and two designs of ratchet type.

2—That the Specifications be revised to recognize certain special designs of geared hand brakes where existing standards will not apply and that such special designs be properly identified by the marking "AAR-S-46", and will be acceptable on cars in interchange, but will not be accorded the same consideration as the standard designs.

NOTE.—In conjunction with this change, it is understood Interchange Rule 3 will be modified to provide for the application of such special designs of brakes to new cars.

3—That the Specifications be revised to require on approved hand brakes the symbol "AAR-1942" either in steel stamped letters at least ¾ in. high or with the symbol cast on the housing.

4—That A. A. R. Interchange Rule 61 be modified to make mandatory the lubrication of geared hand brakes at air-brake cleaning periods.

5—That the lubricants to be used for geared hand brakes should be in conformity with the characteristics outlined in this report and adopted as recommended practice.

The members of the Committee on Geared Hand Brakes are: R. G. Henley (chairman), general superintendent motive power, N. & W.; E. P. Moses, engineer rolling stock, N. Y. C. System, and J. P. Lantelme, general foreman, Penna.

(The report was accepted.)

Prices for Labor and Materials

The committee recognizes the uncertainty of present price conditions and is prepared to determine whether new price quotations warrant immediate rule changes

In order that the rules may currently provide an equitable basis for inter-road billing, your committee has continued the work of analyzing material, labor and new equipment costs in A. A. R. Interchange Rules 98, 101, 107, 111, and 112 of the Freight Car Code, and Rules 21 and 22 of the Passenger Car Code, with a view of determining and recommending necessary changes to be made in the next supplement to the current code.

FREIGHT CAR RULES

Rule 101

All miscellaneous material prices in Rule 101 were rechecked as of April 1, 1946. Quotations submitted by the purchasing agents of the ten selected railroads, representing 39 per cent of the total freight car ownership in the United States and Canada, showed an upward trend in material markets as indicated by detail recommendations for revisions shown under this rule.

A new Item 66-A is added, to provide an allowance for new type AB brake cylinder non-pressure head.

Item 105-A is modified to include a composite type malleable iron and pressed steel journal box lid.

In view of the changes made in Rule 120 in the 1946 Code and further changes recommended by the Arbitration Committee in its 1946 Report, Item 194-B is eliminated, as well as the paragraph which follows Item 201.

Item 210 is modified to provide a penalty price on the same basis as scrap allowance for all No. 2 brake beams applied as new or R. S. S. & T.

Based on new studies made on five railroads which resulted in the adoption of revised methods of computing R. S. S. & T. and average credit allowances, modified R. S. S. & T. and average credit prices are recommended for No. 2 plus, No. 3 and No. 15 brake beams under Items 211, 212, and 213, respectively.

All combination labor and material allowances were modified in Supplement No. 1 to the 1946 Code, effective May 1, 1946, to conform with revised A. A. R. labor rates brought about by an increase in hourly wage rates paid to employees engaged in car repairs.

Rule 107

A new second note is added following Item 240-A, to indicate the work which must be performed to justify charge under Items 239, 240 or 240-A.

Interpretation No. 5 is modified to clarify the intent.

Immediately upon receipt of the announcement of the 16 cents increase in hourly wage rates paid to employees engaged in car repairs, Item 105-A covering freight car labor was increased to $1.90 per hour and key items in this rule reviewed and modified accordingly, and these changes were announced in a circular letter issued by the Secretary on April 5, 1946, effective as of April 1st. All combination labor and material allowances were later reviewed and modified in Supplement No. 1 to the 1946 Code, effective May 1, 1946.

Based on new time studies made on five railroads, Item 281 is completely modified, to provide revised tables and allowances as well as changes in the wording.

A new item 281-A is added to provide separate allowances for the removal of old tack or fillet welding from freight car parts.

A new Item 281-B is added, to provide separate and average allowances per truck side for preheating, preparation, welding and normalizing of cast steel truck side frames.

A new Item 281-C is added, to provide separate and average allowances per hole for welding holes exceeding 1½ in. in diameter in top chord angles of gondola cars.

Rule 111

All combination labor and material allowances were modified in Supplement No. 1 to the 1946 Code, effective May 1, 1946, to conform with revised A. A. R. labor rates brought about by the 16 cents increase in hourly wage rates paid to employees engaged in car repairs.

Rule 112

Recommendations are made in this rule respecting reproduction pound prices of new freight cars of all classes, in order that the supplement of August 1, 1946, may reflect 1945 costs in lieu of figures shown in the present code. New prices recommended are based on the cost of 27,064 freight cars constructed during the year 1945.

Paragraph 4 of Section B is modified, to provide a settlement basis for Class LRC cars used for the transportation of solid carbon dioxide (dry ice).

PASSENGER CAR RULES

Rule 21

Items 18A, 20L, 20 M and 20N are modified to clarify the intent that respective allowances include jacking of car.

A new note is added following Item 23 to clarify the intent with respect to allowances in Items 21, 22, 23, and 24.

A new Item 27 is added to provide allowances for roller bearing units R. & R. or renewed separately in connection with certain wheel-changing operations.

Immediately upon receipt of the announcement of the 16 cents increase in hourly wage rates paid to employes engaged in car repairs, Items 19, 19-A and 20 covering passenger car labor were modified accordingly, and these changes were announced in a circular letter issued by the secretary on April 5, 1946, effective as of April 1st. All combination labor and material allowances were later reviewed and modified in Supplement No. 1 to the 1946 Code, effective May 1, 1946.

Rule 22

All combination labor and material allowances were modified in Supplement No. 1 to the 1946 Code, effective May 1, 1946, to conform with revised A. A. R. labor rates brought about by the 16 cents increase in hourly wage rates paid to employes engaged in car repairs.

It is the intent of the committee to investigate labor and material costs again in October and if sufficient change develops, necessary revisions will be made and inserted in the rules effective January 1, 1947.

Your committee recognizes the uncertainty of present price conditions and feels that in the event of further changes in price quotations on major items of material prior to the next regular semi-annual solicitation from the ten selected railroads as of October 1st, it should determine whether such changes warrant immediate revision and place in effect whatever revisions in price rules may be approved.

[The changes recommended in the rules are shown in detail in the report.—Editor.]

Supplementary Report

In accordance with the last paragraph of page 3 of the report of the committee, dated May 20, 1946, further investigation of material prices has been made and quotations have been secured as of June 1, 1946, on draft gears, brake shoes, couplers, coupler parts and lumber. Computation on the basis of these quotations reflects increases in all of these items over present prices and those recommended in the report dated May 20, 1946.

[The supplementary report listed the changes in detail and recommended that they be made effective on August 1, 1946.—Editor.]

Immediately upon receipt of the announcement of the additional 2½ cents increase in hourly wage rates paid to employes engaged in car repairs, the A. A. R. labor rates and key items in Freight Car Rule 107 and Passenger Car Rule 21 were modified to conform. These changes were announced in the circular letter issued by the secretary on May 29 to become effective June 1, 1946.

All combination labor and material allowances are being reviewed and it is proposed to include the modifications made necessary because of the increased labor rates and material allowances (where involved) in the supplement effective August 1, 1946.

The members of the Committee on Prices for Labor and Materials are: J. D. Rezner (chairman), superintendent car department, C. B. & Q.; T. J. Boring (vice-chairman), general foreman, M. C. B. Clearing House, Penna.; H. H. Boyd, assistant chief motive power and rolling stock, Can. Pac.; A. H. Gaebler, superintendent car department, General American Transportation Corp.; G. J. Flanagan, general car inspector, N. Y. C.; J. J. Root, Jr., vice-president, Union Tank Car Co.; and P. F. Spangler, assistant superintendent motive power, St. L.-S. F.

(The report was accepted.)

Report of the Committee on Wheels

Changes in determination of chill limits by instrumental methods, report on impact effect of flat spots on wheels, and changes in wheel-practice rules

Preliminary experience with the experimental design of chilled-iron wheels that were authorized during August, 1944, disclosed that there was interference between the reinforced flanges of the experimental design and certain unusual types of car retarders and guard rails. Further investigation has resulted in the development of a modification of the experimental design. The modified designs as covered by drawings Nos. 1446 and 1447 of the Association of Manufacturers of Chilled Car Wheels have been approved by the Wheel Committee and submitted to the A. A. R. Engineering Division for approval as to track relationships. Assuming that division's concurrence, authority for the resumption of manufacture for 150,000 750-lb. wheels and 50,000 850-lb. wheels of the revised design will be requested. These wheels will be known as the 1946 design, experimental designation being "AAR XI".

Chill Limits

Since the 1945 report covering determination of chill limits by means of hardness determinations the Association of Manufacturers of Chilled Car Wheels has been able to place further restrictions on the maximum permissible hardness of wheels manufactured to their specifications.

The major changes include the addition of a maximum permissible hardness in the outer portion of the rim; a reduction to 200 Brinell in the permissible hardness in the throat of the flange section of the 750-lb. and 850-lb. wheels and a reduction to 225 Brinell in the case of 650- to 700-lb. wheels. The new hardness test in the rim does not apply to the 650-lb. wheels but does apply to all of the other standard weights. On the wheels which are subject to rim-hardness tests, the test at the center of the tread has been eliminated. The maximum chill is controlled by hardness readings in the throat of hardness section and the outer rim section of these wheels.

In the case of the 650-lb. wheels hardness readings are still taken at the center of the tread. Numerous tests have shown that the average distribution of chill and mottle in the tread of this wheel results in a Brinell hardness of 215 at the point 1-¾ in. below the center of the tread when the hardness 1-½ in. below the throat of flange is at the new maximum of 225. The new maximum is therefore actually more restrictive due to the reduction in the distance from the tread surface.

These changes result in an appreciable reduction in the permissible depth of chill through the throat of the flange section and a much more definite control of chill in the outer portion of the rim.

Wrought-Steel Wheels

The Joint Sub-Committee's report on standardization of wrought-steel wheels has been reviewed and submitted to letter ballot through Circular DV-1906. This circular also includes revisions in specifications for wrought-steel wheels.

Behavior of Chilled Wheels

As a consequence of the study of the service behavior of chilled-iron wheels a recommendation has been offered that a rule be established in the Interchange Code to prohibit the remounting of any double plate cast-iron wheels and any single-plate non-bracketed (excluding the 650-lb. size) cast-iron wheels. In order to clarify Interchange Rule 82 (b) covering the removal of chilled iron wheels because of brake burn, a revision of that rule has been prepared and submitted to the Arbitration Committee.

Cylindrical Treads

The subject of standardizing the contour of cylindrical treads on new wrought steel wheels is to be covered by a questionnaire to member roads.

Impact Effect of Flat Wheels

A subcommittee met on April 11 to consider a report issued by the Joint Committee on Relation Between Track and Equipment on an "Investigation of the Impact Effect of Flat Wheels". The following information was developed:

(1) There was nothing in the report which would indicate that the present A. A. R. Interchange Rules covering slid flat spots are unduly lenient insofar as damaging effect on track is concerned. The information contained in the report would appear to permit an increase in the permissible length of flat spots on passenger-car wheels insofar as damage effect on track is concerned.

(2) The report indicates that insofar as the effect on the rail is concerned while the stresses produced in the track by a 2½-in. flat spot increase with speed to approximately 10 m.p.h., there is no apparent increase in stresses for speeds above this to approximately 60 m.p.h. This appears to clear the way to run passenger trains having flat spots up to 2½ in. to their final terminal without rail damage provided passengers are not unduly inconvenienced by riding qualities or noise.

Manufacturers' representatives present indicated no concern as to the effect of the 2½-in. flat spot on the wheels themselves.

In considering future work, the sub-committee recommended that in addition to the effect on the rail consideration should be given to determining the effect on equipment. The report indicated suggestions as to the manner of making these studies and indicated that such a study might well include provision for determining rail stresses at speeds up to 100 m.p.h. The sub-committee's report also suggested making observations on the effect of out-of-round wheels on both track and equipment.

Revision of Wheel Manual

Proposed revisions to Fig. 132-A and Paragraph 332 of the A. A. R. Wheel and Axle Manual have been offered to provide for a new wheel-circumference measuring tape and the methods of its use for 35- to 52-in. wheels. The revised Fig. 132-A is a new drawing of the tape showing tape sizes up to that required for a 52-in. diameter wheel. The additions to the drawing include the relative locations of tape sizes and wheel diameter between the limits of 35 in. and 52 in.

Paragraph 332 of the Wheel and Axle Manual has been revised as follows:

In the third sentence now reading, "For new cast-iron wheels, tape 3.5 (Fig. 132) represents a wheel of exact nominal diameter" the word *nominal* has been deleted and the dimension of *33 in.* substituted. There has been included just before the last sentence in the existing Wheel and Axle Manual, reading "All wheel tapes should be checked . . .", etc., the following new sentence:

"The wheel circumference gage Fig. 132-A may be used not only for taping new wheels but for taping worn wheels of large diameter inasmuch as this tape is calibrated in increments of 1 in. from a 35-in. diameter wheel to a 52-in. diameter wheel and may, therefore, be used for checking the worn diameter of any of the intermediate size wheels."

The sub-committee recommends, as a letter ballot item, that the first sentence of Paragraph 355(b) of the Wheel and Axle Manual be modified to provide for the use of new type high-speed axle lathes using modified design tool arrangement, as follows:

Proposed Form—(b) Lathe tools used for finishing cuts on collars, journals and wheel seats should have an edge approximately 1¼ in. wide and absolutely straight except for a ⅜ in. radius on one side for cutting the end collar fillet and suitable radius at the other side for cutting the back or dust guard fillet, *or other tool arrangement that will give equivalent results.*

It is understood that, if this modification is approved, similar change will be made in first sentence of Paragraph 189.

It is recommended, as a letter ballot item, that Paragraph 355(o) be modified as follows:

Proposed Form—(o) If journal surface *or end of axle* has pronounced coloring due to overheating, or if circumferential checks or cracks are found, or if cracks are found in wheel seats *or body of axle,* axle must be scrapped, unless such *discoloration,* checks or cracks can be turned out without going below the condemning limits, and the axle *magnetic particle tested before reapplication.* (Also see paragraph 221-A for axle defects and Interchange Rules 84, 85 and 86.)

In this connection, it is also recommended that the last sentence of Paragraph 221 which reads: "Where Magnaflux machines are available all dismounted axles must be Magnaflux inspected before reapplication", and the last sentence of Paragraph 209 which reads "Where Magnaflux machines are available, all axles including those which have run hot in service, must be Magnafluxed after axles are reconditioned, before they are returned to service", be eliminated, account revised Paragraph 355 (o) covers.

Standard Practice Manual

The following modifications of the A. A. R. Manual of Standard and Recommended Practice were recommended:

(1) That the gage for centering wheels on axles and the gage for centrally locating the first wheel on the axle shown in Figs. No. 117 and 117-A (Wheel and Axle Manual) be adopted and included in Section B.

(2) That the alternate mounting gages (Wheel and Axle Manual Figs. No. 118-A and 119-B) be adopted and included in Section B.

(3) That the instructions for using steel wheel contour gage shown on pages B-44 to B-44D inclusive be eliminated.

(4) That the gage designs shown on Manual pages E-B-45, E-B-46A, E-B-49, E-B-50, E-B-108 and E-B-111 be adopted as standard to replace gages shown on Manual pages E-B-45, B-46A, B-49, B-50, B-108 and B-111 respectively.

(5) That the wrought steel wheel hub-depression gage shown on page B-69 be eliminated from the Manual.

(6) That the "Rules Governing Wheel Shop Practice" on pages D-41 to D-46 inclusive be eliminated from the Manual. These are now covered by Section XX of the Wheel and Axles Manual.

(7) That the recommended practice covering the mounting of wheels shown on page D-55 of the Manual be eliminated. This is now covered in the Wheel and Axle Manual.

The members of the Committee on Wheels are: C. B. Bryant (chairman), chief engineer, Technical Board, Wrought Steel Wheel Industry; E. E. Chapman (vice-chairman) mechanical assistant, A. T. & S. F.; H. W. Coddington, research and test engineer, N. & W.; H. H. Haupt, general superintendent motive power, Penna.; A. G. Hoppe, general superintendent locomotive and car departments, C. M. St. P. & P.; A. M. Johnsen, engineer of tests, Pullman Company; E. C. Hardy, assistant engineer, N. Y. C. System; F. Holsinger, wheel shop foreman, Markham shop, Ill. Cen.; W. R. Hedeman, engineer of tests, B. & O., and P. V. Garin, engineer of tests, Sou. Pac.

(*The report was accepted and its recommendations ordered submitted to letter ballot.*)

Report of the Committee on Couplers and Draft Gears

Laboratory tests conducted to increase yield and ultimate strength of knuckles and locks—Wear limits and welding practices on draft keys are recommended—Tests run on gears made in Canada

Draft Key Wear Limits

Upon request for establishing a limit for wear on horizontal draft keys, your committee is making recommendation to the Arbitration Committee that a new requirement be included in the appropriate interchange rule specifying that horizontal draft keys must be removed from service when wear on the edge that contacts the coupler and/or coupler yoke amounts to 5/16 in., as this limit brings the condemning limit within the range where the key can be satisfactorily reclaimed by the reforging method as outlined in the 1940 and 1941 reports of the committee.

Quenching Draft Keys

The general practice followed on most roads is to forge and quench draft keys to increase their hardness and wear resistance properties, although some railroads eliminate the quench to reduce the hardness and take the wear on the key rather than on the more inaccessible parts of the draft-gear attachments.

This proposition was discussed at the last meeting and the secretary was instructed to request three roads represented on the Coupler and Draft Gear Committee to make application on a group of cars that can be closely observed, applying the draft keys as-forged on one end of each car and forged and quenched on the opposite end, making record of the relative Brinell hardness of the keys and observing the manner in which the wear develops on the quenched and unquenched keys and contacting parts. The committee will follow this procedure and report the results.

Type D Couplers

Attention has been called to top-operated Type D couplers inoperative on account of the lock lifter dropping too far into the coupler head. Suggestion as to the use of an open link around the lifter to prevent it from dropping too low was considered.

This practice would serve the purpose as an emergency measure, but was not looked upon with favor as there would be too great a tendency for the coupler in a defective condition to be continued in service with this emergency correction.

The manufacture of Type D knuckles was discontinued in 1932, but Type D bars were manufactured until discontinuance in 1934. During those two years, new Type D bars were fitted with Type E knuckles. During the 14 years the Type D knuckles have been out of production, replacements have been made with the Type E knuckle which, on account of the lock resting on the knuckle-tail shelf, prevents the dropping of the lock lifter as has been experienced with the old Type D coupler and knuckle.

It is essential that the Type D coupler be fitted with the No. 3 top lock lifter or modified No. 2 top lock lifter to complete the correction.

Trains Separating

It has been brought to the attention of the committee that trouble is being experi-

enced on account of train separations due to improper practice in welding and building up worn surfaces on knuckles and locks.

This condition is being found on cars of ownership where such reclamation practice is not followed and shows that these improperly reclaimed parts are being applied while the equipment is on foreign lines. Investigation is being made of this situation on the road making the complaint, but developments are not available at this time for further report.

Rotor Lever Assembly

Mention was made of a proposed articulated rotor lever assembly for A.A.R. Type E couplers in the 1945 report and while some installations have been completed and the equipment is in service, there have been no developments to date, worthy of comment at this time, other than the program is being carried out as originally outlined.

The Standard Coupler Manufacturers Mechanical Committee, under the supervision of the Coupler Committee, completed a program of tests on type E-50 knuckles and type E-40 locks of Grade B steel normalized, of high-tensile steel normalized and tempered, and of high-tensile steel quenched and tempered; and of type H-50 tight-lock knuckles and Type H-40 locks of high-tensile steet quenched and tempered. [The results of these tests are reported in Appendix A which is omitted in this abstract due to lack of space—*Editor*]

Briefly, the results of the tests showed the average yield strength of the normalized and tempered high-tensile steel E-50 knuckle to be 45,000 lb. more than the Grade B steel normalized E-50 knuckle, and the ultimate strength to be 20,500 lb. greater. Similarly, the high-tensile steel, quenched and tempered, exceeded the Grade B steel by 130,000 lb. in yield strength and 142,000 lb. in ultimate strength. The committee considered that the ultimate strength of the high-tensile steel quenched and tempered E-50 knuckle too closely approached the strength of the bar to provide a safe margin between the failure of the knuckle or the failure of the bar. The committee therefore concluded that the high-tensile steel normalized and tempered E-50 knuckle and E-40 lock would best serve to improve the Standard E Coupler. They have status as a standard in specification M-204-39, and were recommended by the committee as a single standard for use in Interchange in place of the Grade B steel knuckle and lock.

The committee saw no objection to the use of quenched and tempered E-50 knuckles and E-40 locks when desired, principally for use on the higher-powered locomotives, but when such is used in Interchange, the committee recommended against the higher-priced knuckle being protected in interchange.

Included in the test program were tightlock coupler knuckle H-50 and lock H-40 for the purpose of obtaining a record of the yield and ultimate strengths. The information obtained was included in the test results, but required no action as this knuckle and lock already has association approval.

The program included static tests on all four knuckles and locks; and dynamic tensile and compression tests on all but the Type H Tight-Lock knuckles and locks. General conclusions drawn by the committee were: that the static tensile tests showed the average yield strength of the quenched and tempered knuckles to be well over the objective of 300,000 lb., and satisfactory; that the dynamic tensile and compression tests showed that the quenched and tempered knuckles had enough ductility to give satisfactory shock resistance under heavy buffing blows or severe jerks; and that from present indications a range of 220 to 270 Brinell hardness might be satisfactory for the quenched and tempered knuckles.

Tightlock Couplers

All A. A. R. Type H tightlock couplers manufactured since May 1, 1945, were assembled with the locks seated on the knuckle tail shelf or not more than 1/8 in. above the shelf. Most railroads having Type H tightlock couplers in service manufactured prior to that date and modified Type T tightlock couplers are refitting the locks to seat in this way. This change in manufacturing practice and the modifying of tightlock couplers in service eliminates the possibility of locks sticking, thus permitting the use of the No. 6 operating mechanism, providing for operation from the left-hand side of the car only. This change will not only reduce the cost of the operating mechanism by approximately one-half, but will simplify the application of couplers and rods by eliminating complications encountered because of brake and signal line locations.

This suggested change in the operating mechanism need apply only to new construction and to T type tightlock couplers that have been modified to the improved anti-creep arrangement in accordance with Standard Coupler Manufacturers Mechanical Committee's Circular 942-A.

The No. 6 tightlock coupler mechanism is shown in application and detail on Plate C, Page C-76 in the Manual. It is recommended that a note be added on this Plate to read as follows: "When it is desired to operate the coupler from the left side of car only, Items H-17, H-19 and H-20 and the uncoupling rods lock lift end and handle end as shown on the right side of the assembly should be omitted."

Short Yoke Arrangement

Mention was made in the 1945 report that consideration was being given to the design of a short coupler yoke for use with A. A. R. tightlock coupler and twin cushion draft gears which could be applied to passenger cars having Standard A. A. R. 24 5/8 in. length draft-gear pocket.

This design has been completed and physical tests conducted by the Mechanical Committee under the supervision of the Committee on Couplers and Draft Gears.

Attached to this report as Appendix B [omitted in this abstract—*Editor*] is a complete record of the physical tests made by the Mechanical Committee under the supervision of the Committee on Couplers and Draft Gears of the proposed short yoke. The results of the test were satisfactory in every respect and your committee is recommending that this yoke identified as Catalog No. Y-65 be adopted as Alternate Standard and an alternate to yoke Catalog No. Y-50 and a substitute for yoke Catalog No. Y-60, which design should be discontinued except for maintenance purposes.

This new design yoke Catalog Y-65, also yoke Catalog Y-50 and attachments are shown as Fig. 1 and if adopted by letter ballot, will replace Plate B on Page C-75 of the Manual of Standard and Recommended Practice.

Tightlock Coupler Yoke

Improvement has been made in the shank-pin retaining key for the vertical pin to prevent this key working out and releasing the vertical pin which is applied from the bottom.

These changes have been studied by your committee and are considered a marked improvement over the present design. They are recommended for letter ballot approval as a part of the A. A. R. tightlock coupler standard attachments.

Type H Tightlock Coupler

Since the type H tightlock coupler, attachments and gages identified as A. A. R. Tentative Standard, has passed the development stage and is rendering satisfactory service it is the recommendation of your committee that a letter ballot item be prepared advancing the Type "H" tightlock coupler, and attachments and gages to A. A. R. Standard.

Type F Freight Coupler

Advancement in the development of this coupler has been retarded by the war effort, but some progress has been made during the year by the Standard Coupler Manufacturers from the standpoint of design refinement of the coupler and attachments. The design work has now reached a stage where it is to be reviewed by the Mechanical Committee of the Standard Coupler Manufacturers, and a Joint Subcommittee representing the Car Construction Committee and the Coupler Committee.

Weak 5-in. Couplers

At the last meeting of the Coupler Committee, recommendation was made to the Arbitration Committee that further extension be granted in the effective date of Rule 3 prohibiting acceptance from owners of cars with 5-in. by 5-in. shanks and cars equipped with former standard (except type D) or temporary standard 5-in. by 7-in. shank couplers to January 1, 1948. January 1, 1948, is recommended as there seems no possibility of such a change being accomplished by January 1, 1947.

Fusion Welding of Draft Keys

Consideration was given to a request that permission be granted for welding up worn surfaces on draft keys by fusion welding. The committee does not concur in this suggestion and supports the recommendation of the Car Construction Committee that a new paragraph be added to Section "B"

of Interchange Rule 23, to read as follows and submitted to letter ballot:

Draft Gear Keys—No welding permitted. Reclamation of draft keys should be by reforging process as outlined in the 1940 and the 1941 reports of the Committee on Couplers and Draft Gears.

Horizontal Yokes

In response to an inquiry as to the practice of building up worn surfaces on horizontal yokes by fusion welding, the Committee considers this a bad practice and has recommended to the Car Construction Committee that an item be added to Section "B" of "Fusion Welding and Bronze Welding, Limits and Regulations"—Section L of the Manual, as follows:

Coupler Yokes, Horizontal Forged Steel—No welding permitted.

Recommendations on Section L

It is recommended as a letter ballot item that Manual Pages L-63, L-64 and L-65, showing Recommended Practice Method of Reclaiming Swivel Shank Couplers, be removed from the Manual on account of the subject being fully covered by Paragraph 1(h) "Coupler Reclamation Practices" of the Standard Specifications for Secondhand Couplers, Manual Page C-66, also by "Fusion Welding and Bronze Welding, Limits and Regulations," shown in Manual Section L and Interchange Rule 23.

Maintenance and Reclamation

The committee wishes to voice approval of the recommendations being presented by the Car Construction Committee relating to "Fusion Welding and Bronze Welding, Limits and Regulations" in Section C of Rule 23, and to be also included as section "C" of the Recommended Practice in Manual Section L, together with certain other revisions recommended in these limits and regulations.

In connection with recommendation being made by the Car Construction Committee for revision of rules and practices relating to maintenance and reclamation of couplers and coupler parts, the committee recommends that the Specifications for Secondhand Couplers for Repairs to Freight Equipment shown on pages C-69—C-72 of the Manual be revised as follows:

Paragraph 2(b)—Proposed form: Couplers must be entirely free from cracks, excessive wear, corrosion and porosity, or welds not performed strictly in accordance with the practices covered by *Fusion Welding and Bronze Welding Limits and Regulations, Section L of the Manual.* For inspection purposes the couplers shall be thoroughly cleaned.

Paragraph under "3. Marking"—Proposed form: Secondhand couplers having body reclained by welding must be stamped with the railroad's initials followed by date reclaimed, in the location shown in Fig. 1, page C-69. (This stenciling on secondhand couplers should not be confused with the marking required on couplers welded in the knuckle side wall *as covered by Paragraph 7, Section A, Fusion Welding and Bronze Welding Limits and Regulations shown in Section L of the Manual and Interchange Rule 23.*

Paragraphs 1(e) and 1(f) under Appendix A, Coupler Reclamation Practices—Proposed form: *Knuckle Sidewall Cracks*—Couplers with cracks in the knuckle side wall of the head may be reclaimed by *the shielded electric arc welding process only,* if all cracks are confined within the shaded area shown in Fig. 5. The markings shown in Fig. 5 shall be legibly stamped on the welded area and the coupler shall then be normalized in accordance with Section 8.

(f) *Guard Arm Cracked*—Couplers with cracks in the guard arm *and front face of coupler, including cracks extending full length of face, into lock opening and into top and bottom wall, may be welded by the shielded electric arc process only. If crack is open more than 1/16 in., parts shall be pressed back to original contour before welding is done.* After welding, the coupler to be normalized in accordance with Sec. 8.

Paragraph 8—Normalizing, under Appendix A, Coupler Reclamation Practices—Proposed form: Where normalizing is specified, such heat treatment shall *comply with paragraphs 6(a) and 6(c), Section A of the Recommended Practice Fusion Welding and Bronze Welding Limits and Regulations, Section L of this Manual.*

Certified Draft Gears

The number of certified draft gears still stands at twelve, three of which are conditionally approved as follows:

Approved—Edgewater B-32-KA, Miner A-2-XB, Cylinder D-7940, Miner A-22-XB, Cylinder D-7935, National M-17-A, National M-50-B, Peerless H-1-B, Waugh-Gould 403, Westinghouse NY-11-F, Westinghouse NZ-11-F.

Conditionally Approved—Cardwell M-25, Hulson-Clark 150-B, Waugh-Gould 410.

Conditional approval is given to new types of gears which have met all specification requirements for approved gears but which have not yet had a sufficient record of satisfactory performance in service to warrant unconditional approval.

Waugh Twin-Cushion Gears

This gear, type WM 4-6, which has met all A. A. R. specification requirements for approved draft gears for freight service and is designed to fit in the standard draft-gear pocket, has so far received only limited approval for use in interchange service. The application of a total of 3900 car sets has been authorized to date. The reason for this limitation is that this gear differs in several fundamental respects from the conventional friction draft gear. Careful initial measurements were taken of a few of the earliest applications and these cars are being brought in periodically for inspection and tests of the draft gears. Four of these gears which were applied to Armour stock cars in 1940 and 1941 were removed and tested recently.

Tests at the A. A. R. laboratory disclosed that these gears were in good condition, had increased from 1 to 5 per cent in capacity, and showed about the same cushioning characteristics as before application. Each gear was reapplied for further service.

Since one of the widely accepted characteristics of rubber is that it retains its resilient properties better when it is "worked" more or less constantly, the committee considered it advisable at the outset to find out what would happen to this cushioning device on a freight car that might be stored for a prolonged period.

Under such circumstances the rubber would be under constant and unrelieved preliminary compression, the condition considered most likely to cause depreciation. Therefore, since 1942 one gear of this type has been kept standing in the laboratory and has been tested for capacity once each month. These successive tests have shown practically no change in the characteristics of the gear to date. Tests will continue.

Gears in Service

Our 1944 report contained results of a check test of approved draft gears after five years of service. These tests were made in 1941. During the coming year it is proposed to make another check test of this kind selecting 10-year old specimens of certified gears that have not been modified during this period. In addition, 5-year old specimens of the newer gears will be selected and tested. The results will be reported in due course.

Canadian Draft Gear

As previously reported, specimens of all types of certified draft gears manufactured in Canada were selected at random from railroad and car builders' stocks by representatives of the subcommittee and shipped to the Association laboratory at Purdue University for check tests. These tests were somewhat delayed, due partly to wartime restrictions, but have now been completed and a report has been prepared. Each manufacturer has been supplied with a copy of that portion of the report which relates to his gear and his comments invited. As soon as these comments have been received and considered, the report will be revised if any corrections are necessary and it will then be submitted to the members. Some serious departures from approved standards were found in gears manufactured in Canada, none of the manufacturers being entirely free from criticism in this respect. All manufacturers, however, have shown evidence of their intention to meet fully A. A. R. requirements in the future. As soon as sufficient time has elapsed to enable the manufacturers to take the necessary corrective steps, another check test of new gears will be made and this will be followed by a check test of Canadian gears removed after a period of service.

The members of the Committee on Couplers and Draft Gears are: H. W. Coddington (chairman), research and test engineer, N. & W.; H. W. Faus (vice-chairman), engineer motive power, N. Y. C. System; N. T. Olsen, principal mechanical engineer, C. & N. W.; F. T. James, chief motive power, D. L. & W.; W. Bohnstengel, engineer tests, A. T. & S. F.; C. K. Steins, mechanical engineer, Penna., and B. Faughman, assistant works manager, Angus shops, Can. Pac.

(The report was accepted and its recommendations ordered referred to letter ballot.)

Committee On Car Construction

Lightweight designs of 40-ft. 6-in. box car, a fixed-end gondola, a 50-ton and a 70-ton hopper car and a 50-ft. lightweight merchandise box car are proposed for adoption as alternate standards

The 1939 and 1940 reports of this committee outlined a program for the development of lightweight box-car designs in cooperation with the Freight Car Design Committee of the American Railway Car Institute. Tentative designs for four types of construction referred to were submitted for study and analysis.

From year to year since that time reference has been made to conditions which prevailed making it necessary to defer the work until a later date.

In the 1943 report, reference was made to emergency designs including several composite types of freight cars made necessary on account of greater demand for steel for national defense. Designs of 50-ft. 6-in. steel-sheathed box and auto-box cars of 10 ft. 6 in. inside height were submitted, adopted by letter ballot as standard designs and are ready for inclusion in this year's revision of the Supplement to the Manual.

Lightweight Welded Cars

Designs for a 50-ton lightweight welded box car were completed and included in Appendix A (omitted in this abstract of the committee's report). It is recommended that these designs be submitted to letter ballot for adoption as alternate standard. This design will have clear inside dimensions of: Length, 40 ft. 6 in.; width, 9 ft. 2 in.; height at eaves, 10 ft. 6 in.; estimated lightweight (body), 26,000 lb.; trucks (with chilled-iron wheels), 15,600 lb.; total weight on rail, 41,600 lb.; approximate saving in weight under A. A. R. standard box car, 5,200 lb.

Designs for a 50-ton lightweight fixed-end steel gondola car were completed and included in Appendix A. This design will have clear inside dimensions of: Length, 41 ft. 6 in.; width, 9 ft. 6 in.; height, 4 ft. 8 in.; estimated lightweight (body), 23,700 lb.; trucks (with chilled iron wheels), 15,600 lb.; total weight on rail, 39,300 lb.; approximate saving in weight under A. A. R.. emergency standard gondola car, 6,200 lb.

Designs for 50-ton and 70-ton lightweight hopper cars, also included in Appendix A, will have the general dimensions shown in the accompanying table.

General Dimensions of Lightweight Hopper Cars

	50-ton hoppers	70-ton hoppers
Inside length, ft., in.	35-0	41-8
Inside width, ft., in.	10-4	10-4
Height rail to top of side, ft., in.	10-8	10-8
Cubic capacity level full, cu. ft.	2,209	2,824
Cubic capacity with 10 in. av. heap, cu. ft.	2,497	3,156
Estimated lightweight (body), lb.	23,300	27,200
Trucks (with chilled iron wheels), lb.	15,600	18,100
Total weight on rail, lb.	38,900	45,300
Approximate saving in weight under A. A. R. standard hopper cars, lb.	2,500	2,600

The committee cooperated with the American Railway Car Institute who prepared the design of a 50-ton lightweight merchandise box car for high-speed service, made of high-tensile low-alloy steel, welded and riveted construction. This design, acceptable in interchange service under the provisions of Interchange Rule 3, will have clear inside dimensions of: Length, 50 ft. 6 in.; width, 9 ft. 2 in.; height at eaves, 10 ft. 5½ in.; lightweight of body, 30,400 lb. If any railroad desires to have cars built under this approval all necessary data covering the design will be available from the American Railway Car Institute, 19 Rector street, New York 6, N. Y.

Drawings have been prepared covering the recommended manner of converting composite box and hopper cars, including selective-type ballast cars. These have been approved by the committee and will be available in the secretary's office for those desiring prints.

One of the tables in the committee report showed that of 17,125 box and auto-box cars ordered from May 1, 1945, to May 1, 1946, 7,750 cars were A. A. R. standard throughout; 8,375 were A. A. R. standard except for minor variations in inside height and width; 1,000 were A. A. R. standard except for floating center sills and 6 in. over-standard height.

Of 9,125 50-ton hopper cars, 6,775 were A. A. R. standard throughout; 350 had minor variations in width and length; 2,000 were A. A. R. standard except for floating center sills. Of 300 70-ton hopper cars, all were A. A. R. standard throughout except 50 which retained standard Z-section center sills and 25¾-in. truck height. Of 750 freight refrigerator cars, 500 were A. A. R. standard and 250 had overhead ice bunkers, but standard center sills and truck height.

To summarize, all new house and hopper cars ordered in the period mentioned, except the refrigerator cars, totaled 26,550 cars, of which 26,500 cars, or 99.81 per cent were A. A. R. standard throughout or conforming thereto, including lightweight alloy steel to A. A. R. base dimensions, floating center sills and inside dimensions to specific conditions. Of 37,026 cars listed, which included 9,726 gondolas, flat, ballast and special type cars, 36,276 cars, or 99.19 per cent have standard 25¾-in. center-plate height and 300 cars, or 0.81 per cent have 26¾-in. center-plate height.

The report listed 14 new designs for a total number of 915 cars for nine owners which were reviewed by the committee, between May 1, 1945, and April 30, 1946, in accordance with the provisions of the first paragraph of Rule 3 and approved for interchangeable service.

The report also included a description and drawings of recommended practice in axle centering, journal dimensions for roller-bearing tubular axles and standard application of wheel-slide-control devices.

Side Frames and Bolsters

Sixteen new designs of truck side frames and 12 new designs of truck bolsters were shown in the report as approved for interchange service since April 15, 1944, including Barber Stabilized swing motion, Type S-4-L and double-truss spring plankless;

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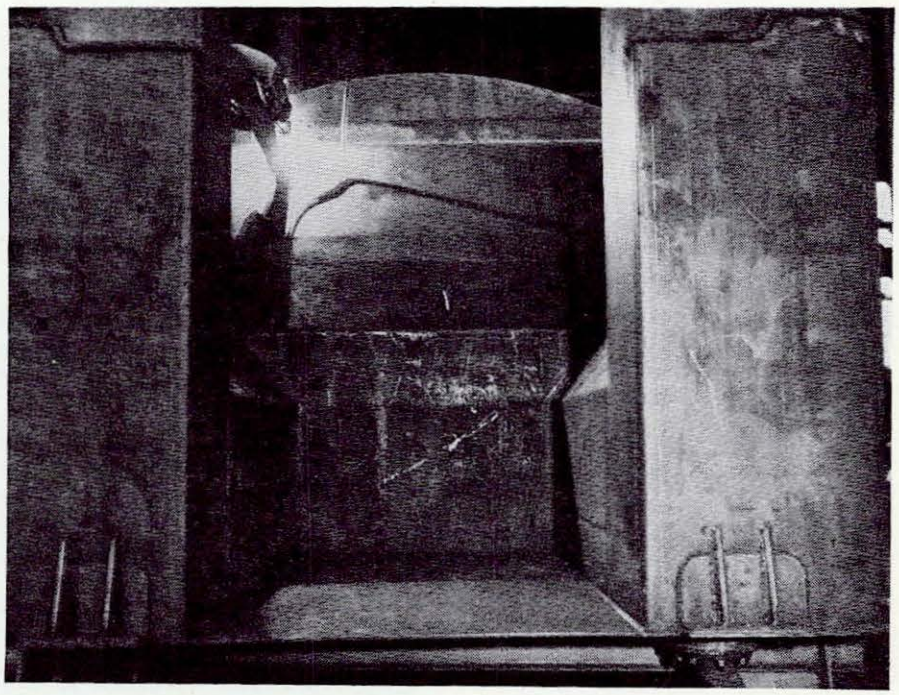

All welded tank shown under construction at the Southern's shops at Spencer, N. C. The tank has a capacity of 10,000 gal. of water and 23 tons of coal. Eliminating T-irons, angle irons and rivets the fabrication by welding saves an estimated 3,500 lb. of weight

Timken outboard roller-bearing high-speed (limited); Cardwell stabilized double-truss; A. S. F. Ride-Control Type A-3 for both plain and roller bearings (limited); Cushioned lateral and vertical motion (limited); and self-alining double-truss spring-plankless. In general, these designs included both Grade B carbon steel and high-tensile alloy steel construction for 50-ton and 70-ton cars. This part of the report also contained a list of 21 applications for approval for side frames and 14 for bolsters, as of April 15, 1946.

Due to the lapse of three years since submission of a complete list of approved side frames and bolsters, such a list was included in the report (Table I), and a second detailed list of applications pending approval (Table II). Reference to previous lists of pending applications show that some of these applications for approval have been pending for a long time. In each of such cases the manufacturer has not yet arranged for the necessary tests or the tests have failed and the manufacturer has not yet complied with the requirements for a retest.

It is important for all member roads to note that some of the approvals listed in the first table are for a limited number of car sets, and before any side frames or bolsters of these types are purchased the purchaser should ascertain from the secretary whether or not all of those authorized have been applied.

A sub-committee suggested a uniform method of marking truck side frames to permit pairing frames on the same truck with respect to the distance between journal-box centers. This is to be accomplished by means of five ¼-in. button heads, cast in a specified location on each side frame and arranged so that one or more may be chipped off, the remaining heads indicating the variation of this particular side frame from standard journal-box center spacing. Details are given in a drawing not included in this abstract of the committee's report.

Spring Snubbers Recommended

The subject of damage to lading in transit was brought to the attention of the committee which reported that factors responsible for the damage include particularly the following: Vertical uncontrolled vibration of springs with attendant damaging shocks to lading, especially at the higher train speeds; rough handling of cars, especially in switching operations; inferior quality of containers; improper loading, etc.; heavier loading of l.c.l. freight and forwarder cars.

It is the consensus of the committee that the use of snubbing devices will materially reduce damage to freight and equipment caused by uncontrolled vertical action of standard truck springs, and it is recommended that consideration be given by all car owners to the adoption of a program under which all interchange freight cars will be equipped with efficient snubbing devices.

It is also recommended that consideration be given to the use of longer travel truck springs on all new freight cars and that existing equipment having present standard springs be changed to longer travel springs where practicable.

It is recognized that truck spring snubbing devices have a definite effective service life and it is recommended that a plan of inspection be inaugurated by the car owners to determine when these devices should be removed for repairs or replacement.

A sub-committee reported that service life tests have recently been initiated on 310 car sets of helical springs installed on Berwind-White cars which are confined to the same territory so that the service can be observed closely. These springs include 100 car sets of A. A. R. 1936 springs, 100 car sets with the proposed A. A. R. 1944 springs, 100 car sets with 2-in. travel springs and 10 car sets with 2½-in. travel springs. Results of this test will be reported later.

The sub-committee assigned to study the revision of brake-beam and shoe design reported contact with the manufacturers and recommended that the modifications approved by letter ballot in 1944 be made tentatively effective January 1, 1947.

The report called attention to brake-beam failures due to tension rods breaking in threads at the base of nuts, resulting in serious delays and expensive derailments, and to reduce these failures recommended the use of Whitworth threads and other revision in repair methods, as shown in Exhibit A (not included in this abstract of the committee's report).

The committee reported that it is investigating methods of preventing disengagement of brake heads from the compression member in case of a broken tension rod and also other means of keeping brake heads from shifting when tension rods fail. In view of service performance, the sleeve-type brake head is recommended as A. A. R. alternate standard.

The report included drawings of a pressed-steel spring-plank design, suggested for adoption as recommended practice, also a design of draft-key retainer recommended by the Committee on Couplers and Draft Gears and suggested for adoption as alternate standard.

Other subjects covered in the report included standard location of AB brake release rods, steam and air connections for passenger cars equipped with tight-lock couplers, application of lading strap anchors to door posts, insect infestation of box cars, passenger-car coupler and buffer height, passenger-car foundation brake gear and welding.

Welding

With regard to the building up of worn surfaces on draft keys by fusion welding, the committee concurred with the coupler committee in recommending that this be not permitted but the keys reclaimed by the reforging process.

The report suggested specific changes in the welding regulations covering truck side frames, heat treatment after welding, emergency welding regulations and limitations, general instructions for the welding of couplers and cast-steel yokes, location and extent of cracks which may be welded in couplers and cast-steel yokes, conversion of 6½-in. to 9⅜-in. butt couplers.

The report listed 23 items which are recommended for submission to letter-ballot and also included a complete record of revision sheets for the Supplement to the Manual.

The members of the Car Construction Committee are T. P. Irving (chairman), engineer car construction, C. & O.; E. P. Moses (vice-chairman), engineer rolling stock, N. Y. C. System; R. B. Winship, mechanical engineer, Can. Pac.; J. McMullen, consulting engineer, Erie; H. L. Holland, engineer car construction, B. & O.; F. J. Jumper, general mechanical engineer, U. P.; R. D. Bryan, mechanical assistant, A. T. & S. F.; L. R. Schuster, engineer car construction, Sou. Pac.; L. H. Kueck, assistant chief mechanical officer, Mo. Pac.; J. K. Peters, mechanical engineer, D. & R. G. W.; W. A. Pownall, assistant to general superintendent motive power, Wabash; J. A. Gower, assistant mechanical engineer, Penna.; and F. G. Moody, superintendent car department, Nor. Pac.

(*The report was accepted and necessary recommendations ordered referred to letter ballot.*)

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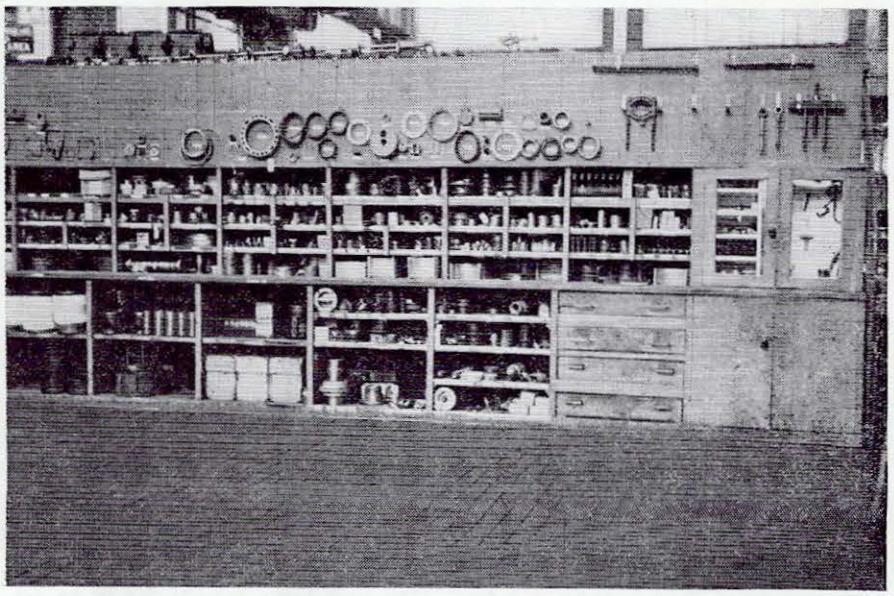
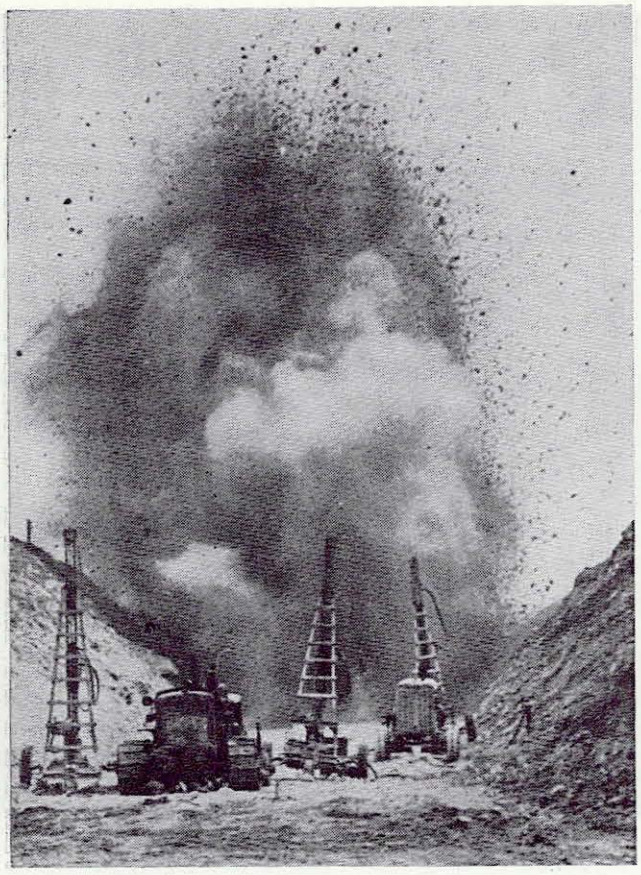


A complete stock of parts for Diesel-electric locomotives is kept adjacent to the repair pits at the Southern's Pegram shops, Atlanta, Ga.

Frisco Line Changes Improve Operation

Two recent relocation projects in Missouri, involving heavy grading, reduce grades and curvature, eliminate helper service and produce other operating advantages



Blasting operations in making a line cut on the Hancock Hill relocation

IMPORTANT operating advantages are being realized on the St. Louis-San Francisco as the result of two related line-change projects on the company's single-track main line in Missouri, carried out to overcome an operating problem of nearly 80 years' standing. These projects involved two adjoining territories with adverse grades and curves, one known as Dixon hill, and the other as Hancock hill.

With a combined length of 12.15 miles, these projects required the movement of 1,171,000 cu. yd. of earth and loose rock, and 866,000 cu. yd. of solid rock, all of which was done with the aid of the latest types of rock and earth-moving equipment and tons of dynamite. From an operating standpoint, they have resulted in the release of a number of helper engines for other service, with large economy, and have had the effect of reducing the running times of trains by permitting the removal of all speed restrictions below 45 m.p.h., and by eliminating costly delays occasioned by the necessity of stopping to couple and uncouple helpers.

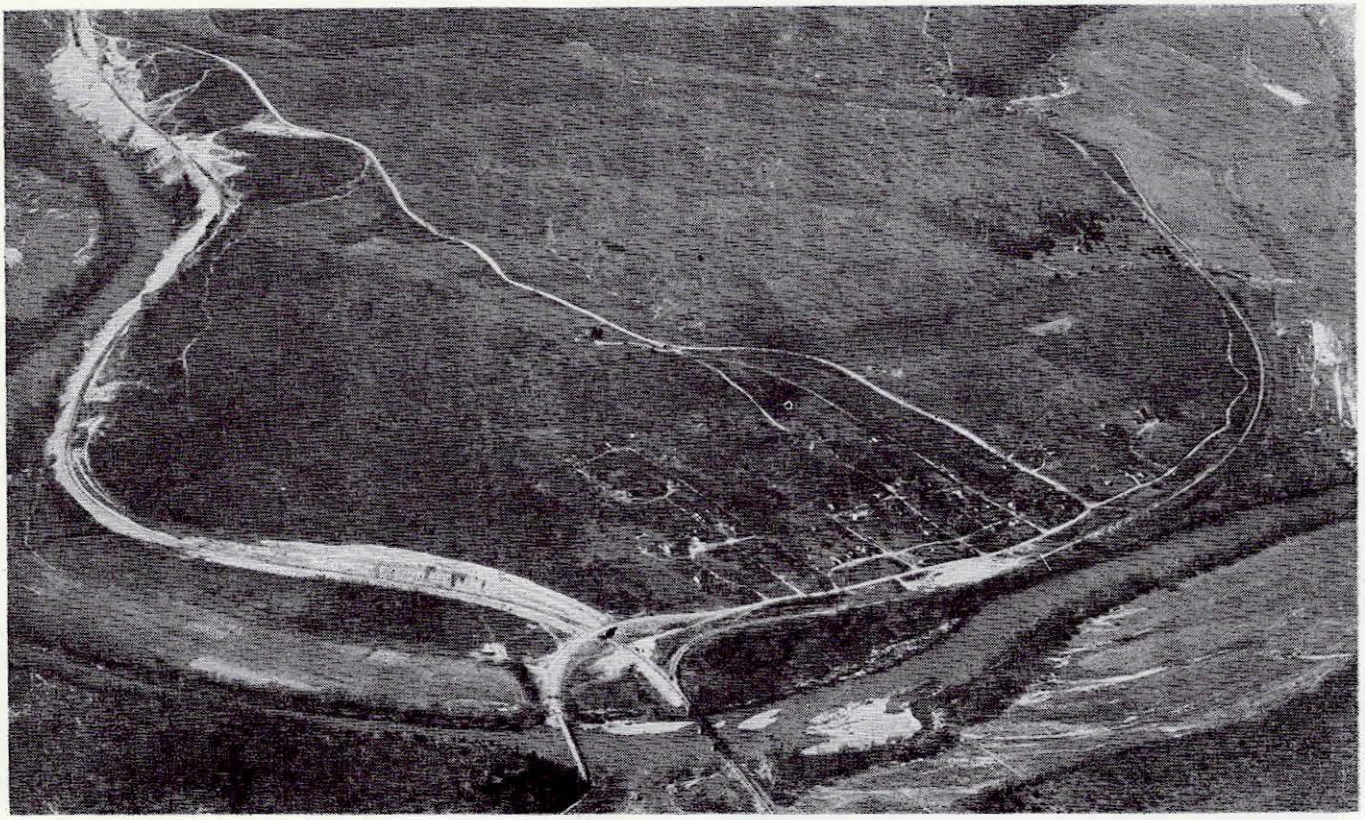
These projects are located in a rugged section of the Ozark mountains in Central Missouri, on the Eastern division of the Frisco between St. Louis, Mo., and Springfield. Through this territory the road extends in a southwestwardly direction from St. Louis, generally following the crests of the ridges. At Arlington, Mo., 123 miles from St. Louis, the line crosses the meandering Gasconade river near the center of a long swing from south to north.

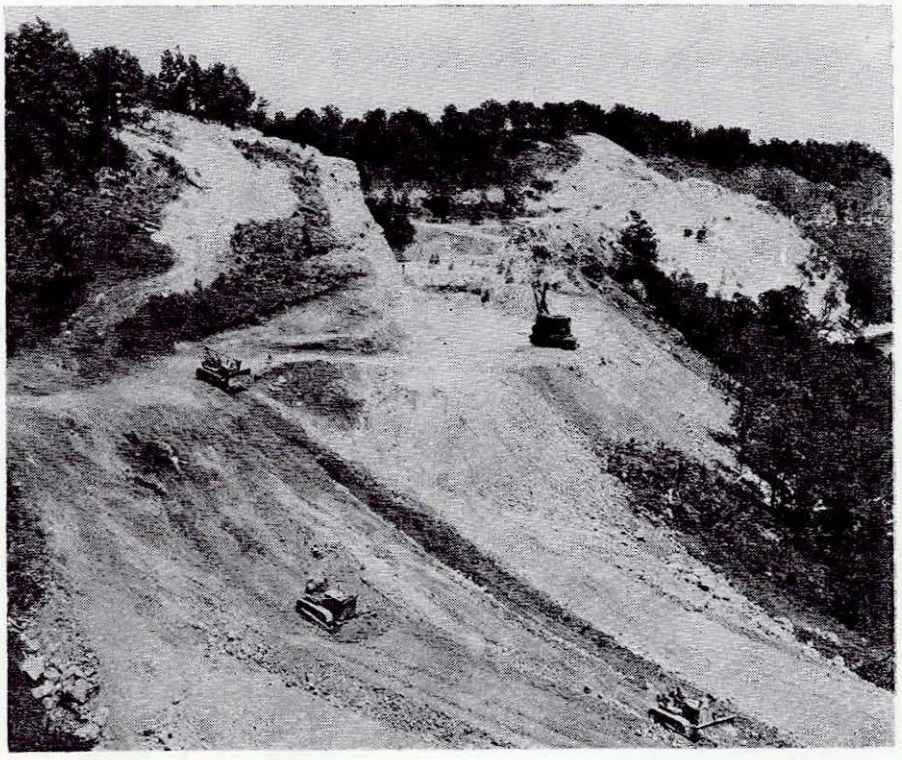
Adverse Grades and Curvature

When the original location surveys for the road were made through this territory just before the Civil War, the the proposed line was to follow the Gasconade river westward from Arlington for about 30 miles, a route which called for the construction of several bridges and tunnels, but which avoided heavy grades and curvature. However, a time clause in the railroad's charter, making it necessary to reach the border between Missouri and Indian Territory in a limited time to obtain certain land grants, resulted in the abandonment of the proposed river line in favor of a more economical and more quickly built ridge route, even though it involved less favorable alinement and grades.

As constructed, the line crossed the Gasconade at Arlington at an elevation of 690 ft., and at once began a steep climb to Dixon, 12 miles to the west, at an elevation of 1,200 ft. From Dixon it continued on a more or less level grade for two miles, and then descended 120 ft., in the next three miles, to Hancock, at an elevation of 1,080 ft. From Hancock the line was built on fairly favorable grades to Springfield and beyond. The east-side climb to Dixon, known as Dixon hill, had many curves, some as sharp as 10 deg., 20 min., and grades up to 2.3 per cent. The western slope, known as Hancock hill, had a maximum curvature of 7 deg. and a maximum grade of 1.75 per cent. Located, as they were, in single-track territory, these hills, containing the ruling grades in both directions, became the most critical points in the operation of the Eastern division, since all through freight trains, and all westward passenger trains with eight or more cars, required helper engines. The seriousness of the situation is evidenced by the fact that in recent years, the daily traffic over this line has varied from 8 to 12 passenger trains and from 13 to 29 freight trains. The tonnage of freight trains, even with the largest class of locomotives used by the Frisco, was restricted because of these hills to 1,250 tons westward and 2,000 tons eastward.

The increase in both passenger and freight traffic during the war, intensified in this region by military movements to and from Ft. Leonard Wood, with its 40,000 troops, located near Dixon, focused the attention of the Frisco on these two hills. As a result it was decided to relocate the railroad on both of the hills, reducing the grades to single-head capacity and greatly improving the alinement. Because of the preponderance of westward loaded movement, Dixon hill, with its more severe operating conditions, was selected as the first project to be undertaken, to be followed immediately by the relocation on Hancock hill.



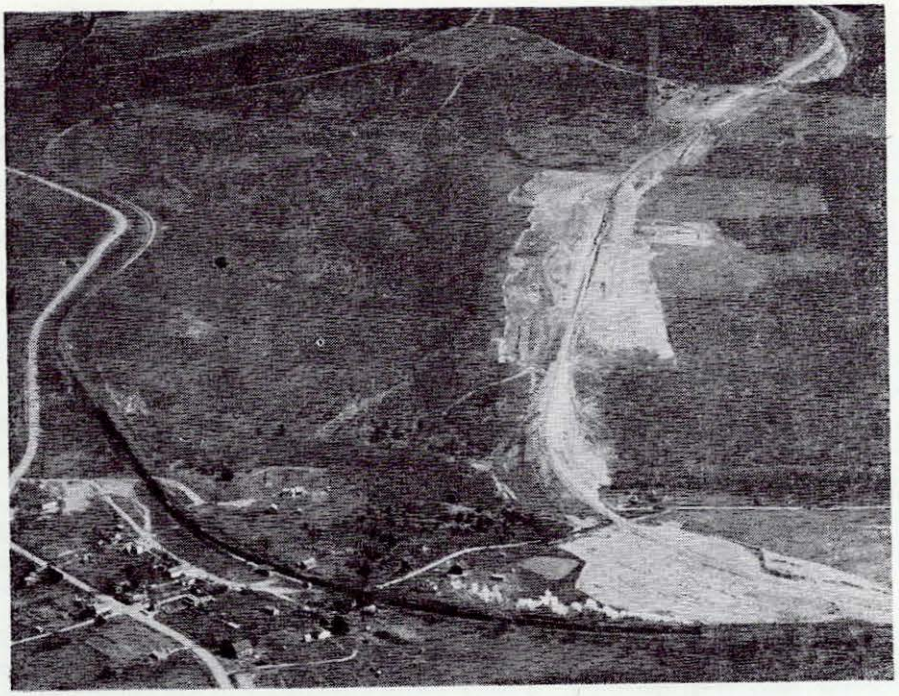


Right—Heavy excavation was necessary in building the new Dixon Hill line along the steep bank of the river. Above — Aerial view, looking west, over the Dixon Hill project. The relocated line extends along the river to the left. The old line, now abandoned, follows the river to the right

Relocation of the railroad on Dixon hill was featured by extremely heavy grading. Immediately west of the existing bridge at Arlington, the new route swings to the south and follows the river for several miles. Since the terrain along the river in this territory is relatively steep and rugged, it was here that the heaviest grading was necessary. Directly at the west end of the river bridge the new line begins to climb on a 1.27 per cent grade, compensated for curvature at the rate of 0.04 per cent per degree, which continues for 2.3 miles. Then, leaving the river and cutting through the hillside into more open country, it continues on the same grade for an additional 2.1 miles, crossing the old roadbed at a 34-ft. higher elevation near a point known as Franks.

West of Franks, the new route follows the old location closely for 3.5 miles. In fact, for several stretches in this distance, totaling 2.3 miles, it occupies the original roadbed, but at an elevation from 3 to 6 ft. above the original grade. Here, the principal objective was to improve the grade, but some reduction was made in curvature.

At the west end of the project, a major line change of 1.1 miles was made to relieve the existing ruling grade of 2.3 per cent and to eliminate sharp reverse curves. This stretch, which involves several deep cuts, passes under the old line and terminates at Dixon wye, where it rejoins the old roadway. The length of the relocated line up



Aerial view of the Hancock Hill relocation, looking east. The old line, shown to the left, remains in service

Dixon hill is 9 miles, which is 1.27 miles shorter than the old route. Of the relocated line, 7.6 miles are constructed on a 1.27 per cent compensated grade. Curvature on the new line was held to a maximum of 5 deg., compared with 10 deg. 20 min. on the old line, and a total reduction in curvature of 1,046 deg. 23 min. was effected, equivalent to nearly three complete circles.

Cuts up to 100 ft. Deep

As already indicated, the grading on the Dixon hill job was particularly heavy because of the extensive side-hill cutting necessary along the Gasconade river. Not only was the country along the river in this location high and steep but it contained numerous sandstone cliffs, separated by precipitous ravines formed by erosion of the softer material between the sandstone outcroppings. Cuts varying from 40 ft. to 100 ft. in depth, on the center line, were made along the hillside. These alternated with fills up to 85 ft. in height.

On the remainder of the relocated line the grading was less heavy. However, in the territory where the relocated line coincides closely with the existing location, there are two 25-ft. cuts, and near the west end of the project there are two 60-ft. cuts and a 50-ft. fill, the latter being 1,600 ft. long.

Excavation of 1,267,000 cu. yd. of material was necessary to complete the relocation on Dixon hill, of which approximately 50 per cent was solid rock. More than 1,100 tons of dynamite were used in blasting for the work.

The contracts for the work, which included all grading and drainage up to the subgrade, were let in two sections. The eastern section, from Arlington to Franks, was awarded to Brown & Root, Inc., Houston, Tex. This contract also included the largest drainage structure in the work, a 14-ft. by 8-ft. concrete arch culvert. A temporary timber trestle, later filled in, was built by railway forces to carry the new line over the old one, so as not to interfere with traffic. Two concrete overhead highway bridges in this section were built by the Gillioz Construction Company, Monett, Mo.

The western section, which was awarded to the List Construction Company, Kansas City, Mo., had no bridges. However, in this section a temporary trestle, erected by company forces and later removed was built to carry the old line over the new. At the locations where the new and old lines were coincident, the track was raised under traffic to the new grade line by the Frisco's maintenance of way forces.

Many of the latest types of rock and earth-moving equipment were used on this project, the major units including a 3½-yd. dragline and 8 shovels, both gasoline and Diesel powered, with capacities from 1 yd. to 2½ yd.; 13 bulldozers; 5 18-yd. Euclid trucks; 5 12-yd. Sterling trucks; 4 9-yd. Allis-Chalmers trucks; 4 5-yd. Mack trucks; 10 5-yd., 1 4-yd., and 14 3-yd. Dumptor trucks; and 9 12-yd. scoops. Other items of equipment used included 2 rooters, 5 road graders, 14 air compressors, 12 wagon drills and miscellaneous smaller units. The Dixon hill project was begun in February, 1944, and was completed at a total cost of approximately $1,500,000, in February 1945. When the old line was abandoned and taken up, the rail, other track material and reclaimable ties were salvaged for use elsewhere.

The shorter, more recently completed Hancock hill relocation lies in open country similar to that found in the western part of the Dixon hill project. Here the curvature in the old line was not as heavy as on Dixon hill, the maximum being 7 deg., and the principal problem lay in reducing the 1.75 per cent grades against eastward trains.

The new route is 3.2 miles long and is roughly parallel to and from ¼ to ½ mile south of the old line. It leaves the old line at Helm, 2.1 miles west of Dixon, on a long 1-deg. curve to the right, beyond which it continues largely on long tangents, there being only three curves in the remaining distance. At the west end of the project a 4-deg. curve brings it back to the old line at Bond.

The new route is all on an eastward ascending grade of 0.80 per cent, compensated on curves at the rate of 0.04 per cent per degree of curve.

Although the country traversed by the Hancock hill relocation is not as rugged as at Dixon hill, the grading was substantial. To reduce the gradient as desired, it was necessary to cross a number of valleys between hills, resulting in nearly 30 per cent borrow for the fills required. At the east end of the project, a series of light cuts and fills are followed by a cut approximately one mile in length, the depth of which varies from 15 ft. to 50 ft. West of this cut are three cuts, each 800 ft. long, and one cut 2,000 ft. long, the depths of which vary from 16 ft. to 50 ft. These cuts alternate with fills from 40 ft. to 87 ft. in height and from 1,000 ft. to 1,700 ft. in length.

A total of 772,300 cu. yd. of material was moved in the Hancock hill relocation, of which approximately 30 per cent was solid rock.

An interesting feature of the Hancock hill project is the method adopted to prevent the accumulation of surface water in one of the longest cuts in quantities greater than the capacity of the track ditches. Throughout this cut, the track is on an 0.80 per cent grade, and there was fear that during heavy rains a larger volume of water might accumulate at the lower ends of the ditches than they could carry, with consequent danger to the track. To avoid this, an open diversion ditch, 18 ft. deep, was cut through the north side of the cut

near its mid-point. Water in the track ditches above this point is diverted into the diversion ditch by a small concrete dam constructed across each ditch, a 24-in. concrete pipe being installed under the track to carry the water from the south side. Berm ditches are also terminated here, so that water flowing westward in them is diverted into the diversion ditch. Paved flumes were constructed on the south face of the cut and on the east side of the diversion ditch to prevent erosion by water from the berm ditches.

The general contractor on the Hancock hill work was the List Construction Company, Kansas City, Mo. The contract for this work, as at Dixon hill, included all grading and drainage, and, in addition, included a steel overhead bridge, with a concrete floor, for a county highway crossing, and a 7-ft. by 7-ft. concrete arch culvert, 290 ft. in length.

Among the items of modern grading equipment used by the contractor were a 2½-yd. Northwest dragline, a 2½-yd. Northwest shovel, a 2-yd. shovel, 10 18-yd. Euclid trucks, 10 5 to 7-yd. Dumptors, 5 12-yd. scrapers and 6 bulldozers. Other equipment included 4 tower drills, 7 wagon drills, 4 air compressors and miscellaneous smaller items.

On Dixon hill the old roadway was abandoned. However, on Hancock hill the existing line was not disturbed and the new line is being used to afford two-track operation under the control of the dispatcher. Equilateral No. 20 turnouts have been installed at both Helm and Bond, the east and west ends, respectively, of the new track. Located in C. T. C. territory, the new arrangement is proving of material benefit in the Frisco's operation. This project, which was completed and placed in service April 30, 1946, cost approximately $705,000.

Both relocation projects were constructed to the same specifications. Fills were put down in layers not to exceed 8 in. of earth or 3 ft. of rock, and compaction of each layer was effected by spreading and compacting with bulldozers, and by careful routing of the hauling equipment over it. All fills are 24 ft. wide at the top and have slopes of 1¾ to 1, except fills made entirely of rock, which have slopes of 1½ to 1.

On some fills, constructed mostly of earth, 36 in. of readily available selected rock was applied as the top course to help distribute the track load and to improve subdrainage.

The side slopes of rock cuts are either ¾ to 1 or 1 to 1, and of earth cuts either 1 to 1 or 1½ to 1 depending on the character of the material. Berms are provided in some of the deeper cuts, sloping away from the track. Twelve inches of selected broken rock were placed below the subgrade in the bottoms of all rock cuts to insure drainage and thus prevent the formation of water pockets under the track. Cuts are 30 ft. wide between outside ditch lines, and 22 to 24 ft. at the inside ditch lines.

All of the track work on both Dixon and Hancock hills was done by forces of the Frisco's maintenance of way department. Ties and miscellaneous track materials were distributed on the grades by highway trucks. Rails were unloaded at convenient points and were snaked to the site by crawler tractors. Ballast was unloaded by work train after the track was laid. Track standards on both projects called for new 112-lb. RE rail, 112-lb. double-shoulder tie plates, 24 ties to the panel, and a full section of chat ballast, with a minimum of 12 in. under the ties. The track throughout is well anchored with anti-creepers.

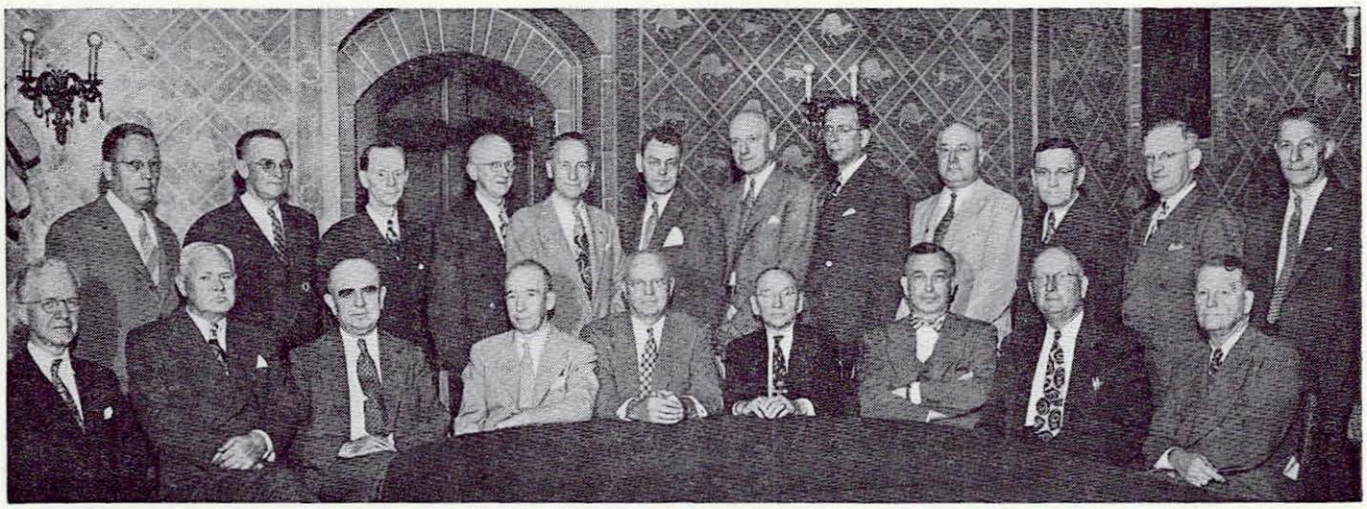
Marked Improvement in Operation

On Dixon hill, the use of five helper engines with eight crews working 12 shifts daily has been eliminated. The tonnage rating, westbound, of the Frisco's largest class locomotives has been increased from 1,250 tons to 2,175 tons. Another advantage is a saving of 8 to 12 min. in the running times of trains, as a result of the elimination of former speed restrictions as low as 15 m.p.h. on five curves of the old line. On the new line there are only two restricting curves, which limit speeds to 45 m.p.h. Since the new line on Dixon hill is 1.27 miles shorter than the old route, savings will also be realized in the cost of track maintenance.

Savings resulting from the Hancock hill project will be somewhat smaller than those on Dixon hill, but still will be substantial. Two helper engines were formerly in service here. Also, the new work shortens the running times of trains in both directions, and, through the second-track operation afforded, reduces delays for meets. Single locomotives may now haul up to 3,425 tons over the hill, compared with the former 2,000-ton limitation.

The work at both Hancock and Dixon hills was planned and carried out under the general direction of the late Col. F. G. Jonah, who was chief engineer of the Frisco until his death in December, 1945, and H. B. Barry, who succeeded Col. Jonah as chief engineer, with headquarters in Springfield, Mo. E. T. Bond, Sr., who retired on May 1, 1946, was resident engineer in charge of both projects, with headquarters also at Springfield.

Modern grading equipment laying up one of the heavy fills on the Hancock Hill project



Officers and members General Committee, Purchases and Stores Division, Association of American Railroads; seated left to right—M. E. Towner (Western Maryland), Vice-chairman elect F. S. Austin (New York Central), C. H. Murrin, chairman (Louisville & Nashville), W. J. Farrell, executive vice-chairman, retiring chairman, E. J. Lamneck (Pennsylvania), R. D. Long (Chicago, Burlington & Quincy), J. V. Miller (Chicago, Milwaukee, St. Paul & Pacific), E. G. Roberts (Chicago, Rock Island & Pacific), J. H. Lauderdale (Missouri Pacific). Standing—H. M. Rainie (Boston & Maine), E. H. Polk (Southern Pacific), A. L. Sorensen (Erie), A. W. Munster (Boston & Maine), L. L. King (Illinois Central), John L. Timanus, assistant secretary, A. A. R., F. C. Turner (Northern Pacific), G. T. Wickstrom (Union Pacific), H. E. Warren (Gulf, Mobile & Ohio), C. B. Neubauer (Southern), J. L. Quarles, (Chesapeake & Ohio), and V. N. Dawson (Baltimore & Ohio)

P. & S. Division Convenes Again

First post-war convention features addresses by prominent speakers and the presentation of 20 committee reports

CHARACTERIZED by a large attendance and dedicated to the improvement of the art of purchasing, storing and control of materials, the twentieth annual meeting of the Purchases and Stores Division, Association of American Railroads, held at the Palmer House, Chicago, on August 8-9, was endowed with special significance for at least two reasons: (1) It marked the resumption of the practice of holding annual meetings which was interrupted during the war years; and (2) it constituted, for the Division and its members, the final step in transition from war to peace, with the emphasis now altogether on those problems and matters which, from a material and supply standpoint, are demanding attention in the interest of improving the competitive position of the railroads in the transport field.

Indicative of the intense interest in the work of the association is the fact

F. S. Austin, *Vice-Chairman*

C. H. Murrin, *Chairman*

W. J. Farrell, *Executive Vice-Chairman*

that 450 members and guests registered at the meeting. That the work accomplished was also at a peak is seen in the approval of 20 subject committee reports, all of which represent newly recommended practices for the consideration of the individual railroads.

Both morning and afternoon sessions were held on Thursday and a morning session on Friday, all of which were presided over by Chairman Lamneck, general purchasing agent, Pennsylvania, assisted by W. J. Farrell, executive vice-chairman.

In the election of officers C. H. Murrin, general storekeeper, Louisville & Nashville, was installed as chairman for the ensuing year and F. S. Austin, purchasing agent, New York Central, was elected vice-chairman. W. J. Farrell continues as executive vice-chairman of the Division with headquarters at Washington.

Among the highlights of the meeting was the presentation of subject committee reports and many timely and interesting addresses. These included papers on The Value of the Purchasing and Stores Department to the Railroads, by D. V. Fraser, president, Missouri-Kansas-Texas; A Look at the Job, by Clark Hungerford, vice-president, operations and maintenance department, A. A. R.; The Need for Better Understanding of Railroad Problems, by Col. Robert S. Henry, assistant to president, A. A. R.; and The Present Material Situation, by Robert Glenn, director, Division of Manpower and Materials, Office of Defense Transportation. Among the other papers were those submitted in conjunction with the annual essay contest. Authors of two of the winning papers were invited to attend the convention and present their papers in person, namely, Arthur J. Sowatsky, chief clerk, stores department, Pere Marquette, and John L. Hamilton, head clerk, stores department, Pennsylvania.

In his address, Mr. Fraser urged the industry to modernize equipment and methods of operation. He emphasized the benefits that purchasing and stores officers derive from these annual meetings and suggested that they also investigate the unlimited possibilities of light metals, magnesium, plastics, fabrics, preservation coatings and other modern materials and supplies.

Operating Cost Increase

Commenting on the mounting operating costs confronting the railroads Mr. Hungerford said: "Price rises on mechanical equipment, supplies and fuel have continued since the end of the war and on the basis of this year's operations will add more than $500 million to railroad operating costs above the 1939 level. Three general wage increases in the last five years have increased costs on the basis of 1946 employment by another $1,269,000,000.

"With the end of the war, it was felt that a return to peace-time traffic would make it possible for the roads, within a reasonable time, to modernize their traffic handling plant, either by making heavy repairs to existing equipment or replacing that which had become obsolete or worn out. Subsequent events, however, portrayed an entirely different picture from the view held on VJ day. Strikes in major industries tied up one plant after another that could have produced materials or new equipment for the railroads."

Discussing material problems, Mr. Glenn declared the situation is more critical now than at any time during the war. According to the speaker the items of greatest concern at the moment are lumber, steel and steel castings. It will be almost impossible for forge plants and foundries to fill railroad orders for steel and steel castings, with the priority on pig iron that the Civilian Production Administration granted recently for housing items. This priority will take about 40 per cent of the total pig iron production for the next 60 days. Mr. Glenn stated that the O. D. T. has demanded that C. P. A. annul this order or reduce it substantially in order that railroad requirements may be forthcoming.

Col. Henry stressed the need for closer cooperation between the railroads and suppliers, and said the supply companies could do a much better job of enlightening the public regarding problems the roads face than the railroads or their employees. He stated that substantial progress has been made along these lines, but that this problem was not one that could be pushed today and forgotten tomorrow; on the contrary it requires constant attention, if the railroads are to receive just and equitable treatment.

In assuming his new duties as chairman of the Division, Mr. Murrin paid high tribute to retiring Chairman Lamneck for the splendid work the Division has accomplished under his leadership. He also stated: "There is plenty of work ahead for this Division, and with the assistance of Vice-Chairman Austin, the General Committee and the able, untiring and conscientious efforts of our executive vice-chairman, I will endeavor to ast as its chairman to the best of my ability."

Presented with this article are the abstracts of 18 subject committee reports that were accepted and approved during the meeting. These reports contain many specific recommendations with respect to procurement and reclamation problems.

In addition to Chairman C. H. Murrin, general storekeeper, Louisville & Nashville; Vice-Chairman F. S. Austin, general purchasing agent, New York Central; and Executive Vice-Chairman W. J. Farrell, Transportation Building, Washington, D. C., the members of the General Committee are G. M. Betterton, purchasing agent, Southern Pacific; V. N. Dawson, general storekeeper, Baltimore & Ohio; J. S. Fair, Jr., purchasing agent, Pennsylvania; W. W. Kelly, general purchasing agent, Atchison, Topeka & Santa Fe; L. L. King, purchasing agent, Illinois Central System; J. C. Kirk, assistant purchasing agent, Chicago, Rock Island & Pacific; J. H. Lauderdale, general purchasing agent, Missouri-Pacific Lines; R. D. Long, general purchasing agent, Chicago, Burlington & Quincy; D. Mck. Ford, vice-president, Canadian National Railways; J. V. Miller, manager of stores, Chicago, Milwaukee, St. Paul & Pacific; C. B. Neubauer, assistant to vice-president, Southern; J. L. Quarles, superintendent of stores, Chesapeake & Ohio; H. M. Rainie, purchasing agent, Boston & Maine; M. E. Towner, general purchasing agent, Western Maryland; F. C. Turner, general storekeeper, Northern Pacific; J. W. Wade, general storekeeper, Norfolk & Western; H. E. Warren, vice-president, purchases & stores, Gulf, Mobile & Ohio; and G. E. Wilson, manager stores, Reading.

Report of General Committee

Because of the postponement of the 1945 Annual Meeting, the General Committee directed the report of the Nominating Committee be submitted to the membership by letter-ballot vote, which resulted in the election of the present officers and General Committee members, and approval of the 1945 Subject Committee recommendations.

It was decided by the General Committee that the annual meeting would be held during June, 1946, and arrangements were completed, but because of prevailing conditions. it was necessary to postpone the meeting until August 8-9. No annual meetings of the division have been held since 1941, primarily because of the war emergency.

Governmental Agencies

Cooperation with governmental agencies has been continued to the extent necessary, and the railroads have been currently informed through the executive vice-chairman's office of important matters pertinent to the material situation.

The Forest Products Committee has been particularly active with respect to lumber, crossties and switch ties, which have continued to be in very short supply during the year. As a result of a careful and thorough study by this committee, representations were made through the

Special Purchasing Committee, and the executive vice-chairman's office to the Office of Defense Transportation, to obtain better recognition of the importance of railroad lumber and tie supply. Favorable results have been obtained which we feel have benefited the railroads to a considerable extent.

The regional group committees were reappointed and a few necessary meetings have been held, but because of prevailing conditions it was not possible for all of the regional groups to hold meetings. It is expected, however, that the normal procedure of meetings will be possible soon and the group chairmen plan to revert to the normal schedule as soon as conditions permit.

Through the Committee on Simplification and Standardization, cooperation with the Bureau of Standards of the Department of Commerce has been maintained.

At the request of the vice-presidents, Operations and Maintenance Department and Accounting Department of the A.A.R., a joint committee was appointed during 1943, consisting of representatives of the accounting, transportation, engineering and purchases and stores divisions, with the ultimate purpose of reducing paper work relating to managerial reports of the railroads.

The contribution of this division to the committee consisted of an outline of the basic records and reports, based on the stock record. A complete report of the joint committee has been approved by all of the departments concerned and was reprinted in full in A.R.E.A. Bulletin 457, issue of January 7, 1946.

The special purchasing committee has continued to cooperate with the vice-president, Operations and Maintenance Department, and the government agencies on all important matters relating to the general material situation. The assistance of this committee in conjunction with the lumber and tie situation was particularly valuable. Matters relating to the steel situation, the uncertainty of which has been accelerated due to recent interruptions in production, will be studied further by this committee.

The committee on Fuel and the Coal Sub-Committee have continued to follow important developments in conjunction with the executive vice-chairman's office, with the Solid Fuels Administration and the former Petroleum Administration, and will continue to be active in connection with any developments relating to these commodities which may affect the railroads in the future.

C. H. Murrin is chairman of the Committee on Committees. Because of the deferment of annual meetings during the past several years, and at the direction of the General Committee, is was not deemed advisable or necessary to change the committee personnel to any great extent during the war years. The committee, after a careful survey and study of the personnel, presented a report to the General Committee and the committees were appointed soon thereafter making it possible for the present committees to become active and study their subjects soon after their appointments, which has reacted very favorably and is reflected in the valuable committee recommendations presented at this annual meeting.

Efforts have been continued through the executive vice-chairman's office with the War Assets Administration in an endeavor to emphasize further the importance of affording the railroads an opportunity to obtain such surplus materials as they can use. It was pointed out to this agency that the railroads desire to cooperate to the greatest extent possible. Lists of surplus materials published by that agency are being circulated to the railroads through the regional offices of the W.A.A., and several of the individual roads have been contacting these agencies. This will be continued and every effort should be made by the railroads to obtain such materials as can be used.

Annual Essay Contest

The annual essay contest has been conducted during the past year under the supervision of a committee of which M. E. Towner was chairman. The committee has selected the following as the best papers submitted in the contest and the authors have been invited to attend the annual meeting, and present their papers:

"The Purchasing and Stores Department Place in the General Scheme of Railroad Operation," by Arthur J. Sowatsky, chief clerk, Stores Department, Pere Marquette, Saginaw, Mich.

"How Can the Purchasing and Stores Department Know with Certainty What is Minimum Stock?" by John L. Hamilton, head clerk, Office of reporting storekeeper, Pennsylvania, New York, N. Y.

The comittee also recommended that the following receive honorable mention:

"Teamwork and Cooperation between the Purchasing and Stores Departments," by C. R. Muray, chief clerk, Purchasing Department, Southern Pacific, San Francisco Cal.

"The Purchasing and Stores Department Place in the General Scheme of Railroad Operation," by John A. Stauffer, section stockman, Baltimore & Ohio, Elk Run Junction, Pa.

Loss and Damage Prevention

*By J. U. KING, Chairman**

The amount paid each year by Class I railroads because of loss and damage to freight continues to increase rapidly. During 1941 loss and damage claims cost approximately $22,000,000 . In 1944 this figure had increased to $60,000,000 and in 1945 it reached the staggering total of $75,971,817. Freight revenues during this same period have risen from approximately $4,500,000,000 in 1941 to $7,000,000,000 in 1944, falling to $6,500,000,000 in 1945.

The purchases and stores departments can render material assistance to the freight claim departments in preventing loss and damage, and in economical disposition and salvage of articles which reach the salvage warehouse. Your committee suggests that each road review carefully recommendations which have been made in committee reports since 1939. Special attention is invited to recommendations page 81, 1939 proceedings.

It has been stated recently that railroad stores are accused of failure to mark properly, or mark at all, returned drums, cylinders, etc. Your committee in its 1945 report offered two suggestions to prevent loss and damage to such lading, viz.: (1) Paste properly prepared shipping labels on drums or reels with specially manufactured liquid paste or glue. This liquid makes labels impervious to weather conditions. The cost of this glue is reported to be $1.50 per gallon. (Trade name of supplier may be obtained from executive vice-chairman.) (2) Stencil return address on drums or reels when received, if there are no markings to identify owners.

The improper marking for shipment of rolled steel products is also causing claim departments much concern. Stores personnel can help correct this practice by reporting to purchasing agent, for handling with shippers, any less-carload shipments of steel received, not properly marked. The Freight Claim Division has issued an illustrated booklet on this subject, entitled "Marking and Bundling Steel and Steel Products," which will do much to induce shippers to mark such shipments properly.

Reducing Damage Claims

On one of our largest railroads, an organization of loss and damage inspectors has been established. In the larger agencies, an inspector is assigned to one station. Smaller agencies are serviced by an inspector, who travels over the division. The duties of these inspectors are generally as follows: (a) Contacting shippers to improve crating, loading and marking of freight; (b) matching over and short freight; (c) investigation of shortages and claims and (d) examination of damaged merchandise to determine if damage was actually caused in transportation. Such examinations have proved especially fruitful. In some instances it has been found that damage was actually due to defects in manufacture; in others, damage occurred in storage prior to shipment. These inspectors also investigate the handling of cars in transportation yards where damage to lading has been caused by rough handling over humps, etc. As the stores department is one of the railroad's largest customers, such a system can detect quickly any shortcomings in crating, loading, marking of freight, etc.

One railroad, operating less than 1,000 miles of track, has a unique plan for handling the sale of unclaimed and damaged freight. A contract was negotiated with one of the stores department employees to dispose of such material on a percentage basis. The materials to be disposed of are shipped to the local freight agent, general store point, and the contracting employee picks up the material by truck and gives the agent a receipt. Any of the material that can be used advantageously by the railroad is sent to the general store instead of being sold. The contract with this employee calls for the furnishing of

* Assistant Purchasing Agent, Atlantic Coast Line.

bond in amount sufficient to protect the railroad, and he is required also to carry insurance sufficient to cover all materials turned over to him. This plan has been in effect for over a year and it is reported to be working satisfactorily. During the last year, sales have amounted to approximately $15,000, and salvage value amounted to about 70 per cent. This is considerably more than was realized when damaged freight was disposed of at the source.

Safety and Fire Prevention

*By J. V. ANDERSON, Chairman**

The railroads are still confronted with many accidents and fires that could be avoided and, from a humanitarian and monetary standpoint, it is our duty to exert our earnest efforts to eliminate the causes. With the chaotic conditions existing in our country today, we cannot afford to add further difficulties, resulting from such accidents and fires.

Many railroads have realized that education is required to attain results in eliminating accidents, and it is recommended that a program of educational activities be put into effect. These activities may include:

Analysis of Accidents—Analysis should furnish information helpful in reducing similar accidents.

Safety Posters and Films—Posters should be placed in conspicuous places and should clearly attract attention and be applicable to a department. A poster may be suitable for one department but worthless to another, because the accident portrayed does not apply to the particular department. Safety films whenever possible, should be shown at safety meetings. These films, like the safety posters, should be applicable to the department. Safety slogans are also helpful, they can be posted on bulletin boards and other conspicuous places. They should be catchy and should be changed frequently.

Safety Shoes and Goggles—Campaigns urging the use of safety shoes by all employees should be inaugurated, and supervisors should make a special effort to induce new employees to equip themselves with this type shoe immediately after employment. The use of goggles should also be stressed and supervisors impressed with their responsibility to see that all safety rules concerning goggles are obeyed.

Job Training—The prevention of accidents, in handling materials and parts, etc., is largely a training job. Therefore, it should be the responsibility of supervisors to see that all employees under their supervision are properly trained to perform their work safely. Actual demonstrations of safe-handling practices should be used in job training. On-the-job instructions to be given by supervisors should consist of emphasizing one or two practices over a period of weeks, such as cautioning workers to take a good grip before lifting, to get help when necessary, lift with legs, keep hands and feet in the clear, etc., as occasions arise. This method imposes no undue hardship or extra work on the supervisor, because corrections can be made during supervision of the work.

New Employees — New employees should be given a book of safety rules upon entering the service, with a request that they become acquainted with all rules. Some railroads require a receipt or acknowledgment from the employees when they are given the book of safety rules. New employees should be put at ease; their backgrounds discovered and handled as individuals. Impress the importance of safety and of taking care of themselves. The supervisor should present to them the operation they are to perform and explain all the details they should know. They probably will not grasp it all at once, but later, after they have gained experience and as other employees explain and show them the different tricks and knacks, it will come to them from their sub-conscious mind. A follow-up system should be put into effect to determine how new employees are progressing.

Accident Prevention

Injuries in the operation of hand and power trucks, tractors and other mobile equipment are a cause of considerable concern. Some of the causes are: No safety shoes (feet caught under wheels, etc.); walking too close to moving vehicles; operator not warning nearby workers; no guards on trucks to protect operator; lack of guard curb on ramps; operator not facing in direction of movement; not crossing tracks at right angles; hands in pinch point in coupling and jumping from mobile equipment in motion. At safety meetings, safe practices in trucking and mobile operation should be stressed; all workers should be informed about hazards, such as walking too close to moving trucks, warning nearby workers before starting, backing or other movements, riding on trucks and other equipment. The following should also be emphasized: keep within safe speed; do not operate defective equipment and the wearing of safety shoes.

Crane and Hoist Accidents

Crane and hoist accidents are also important problems which should be given attention. Some of the causes are: Not in clear of swinging loads (feet and hands under loads in setting down), loose or other poor hitches, lifting at an angle, cables breaking, not signaling and not warning nearby workers.

Fire Prevention

For many years the railroads have been active in Fire Prevention, but at no time has the necessity for such activity been greater than at present. This subject is of vital importance to all employees engaged in the handling and storing of railroad material and supplies. Fire losses per mile of railroad increased from a low of $13.16 in 1940 to $35.83 in 1944, or approximately 63 per cent, and the average loss per fire on the railroads increased from a low of $597 in 1936 to a high in 1944 of $1,730, or approximately 65 per cent.

Fires seldom occur automatically. The origin can be traced to a definite cause, and many are classified under the heading of "carelessness." Statistics reveal that a large proportion are caused as a result of "carelessness." In statistical tabulations for 1944, the class "smoking-matches" showed 544 fires with loss of $639,010.00, and no doubt this loss is due to careless use of smoking material and matches.

Good housekeeping is important in preventing fires. If buildings and grounds are maintained in neat and orderly condition, a hazard has been removed, and one sure way to be safe from fires is to remove the cause. All employees must be taught to realize the importance of fire prevention. Those who forget this urgent message are putting their lives and property in jeopardy.

Fire-fighting Apparatus—It is important that adequate and proper fire-fighting apparatus be available, and subject to routine inspection. Equipment found inoperative should be repaired or replaced immediately. Every piece of apparatus must be ready for instant use.

Storage Batteries—Storage batteries that generate only 6-volt circuit can under certain conditions cause fires if a short circuit is caused by some metallic object making contact between terminals, when combustible materials or other batteries are in the immediate vicinity. Storage batteries should be shipped or stored in boxes with covers and terminals protected to prevent short circuiting.

Diesel Oil Storage

With the increased use of Diesel-electric locomotives, the handling and storage of oils in bulk and the daily distribution to locomotives require careful consideration from a fire prevention standpoint as fires among such supplies can easily retard operations and cause heavy losses. All fire prevention and protection facilities should be taken into consideration on all installations for the storage of Diesel oil. Specifications and recommended practices of the Fire Prevention and Insurance Section—A.A.R., National Board of Fire Underwriters and the Railroad Insurance Association, are available to assist in prevention of fires in Diesel oil storage facilities. The Railroad Insurance Association recently issued a pamphlet entitled "Diesel Locomotives," which contains valuable information in conjunction with storage and fueling Diesel locomotives.

It is important to see that adequate fire-fighting equipment is available and in operating condition at all times. The use of spray nozzles in handling oil fires should be given consideration when providing fire protection at Diesel oil storages. Gasoline and oils are a constant fire hazard, and it is the responsibility of all concerned to see that constant attention is given all facilities and handling, and that all recommended practices of the Purchasing and

* Asst. Gen. Storekeeper, Chicago, Milwaukee, St. Paul & Pacific.

Stores Department Manual and Fire Protection and Insurance Section—A.A.R. are followed.

Heating Devices—Providing heat in buildings to prevent freezing of water in pumps and pipe lines cannot be accomplished by open-flame fires without increasing the fire hazard. It is recommended that an outside enclosure be provided in which heating devices can be maintained, circulating hot water or steam to the facilities which require heat.

Diesel-Electric Locomotive Parts

*By F. J. STEINBERGER, Chairman**

We have been using Diesel material long enough to realize that there is nothing particularly difficult about its handling, and that it should be given the same supervision and conform to the same rules as repair parts for steam power. Records can be maintained on stock cards or stockbooks, whichever the railroad employs. Regardless of the source of supply, each item must be cross referenced in stock records with the builder's number. Storage of material should be maintained according to the accepted practice of steam roads. Because of the heavy demand for Diesel power, the subject of repair parts should be given careful consideration and material should be ordered sufficiently in advance to avoid any delay.

Many methods have been advanced for the ordering and maintenance of stocks, some of which require a constant flow of certain items at stated periods. This committee recommends that no such practice be established and that the ordering of Diesel material conform to the same pattern as other railroad repair parts, being based strictly on requirements, as any of these so-called special processes will cause an accumulation of surplus and obsolete material with resultant extra handling for its disposal. Many railroads are adding new facilities to take care of their Diesel power, and serious consideration should be given to storage problems in order to protect future expansion.

Stock Balances

The following figures reveal the amount of material maintained on some roads for Diesel repairs. It should be noted that some of these railroads have heavy freight and passenger power while others are confined mainly to switching power and, consequently, their stock per horsepower would not be as high as those with a greater number of road engines.

With few exceptions, all roads reporting are accounting for material issues direct to individual engines. Apparently, management feels the need of individual engine performance records. We believe that the accounting should be done by engine classes. It is therefore the recommendation of this committee that accounting for Diesel material be considered in the same category as steam, thus eliminating special handling.

Railroad	No. of Locomotives and Type		Hp.	Stock Balance	Stock per hp.
Road A	Pass.	15	45,000		
	Frt.	80	432,000		
	Sw.	145	127,000		
		240	604,000	$2,325,595.00	3.85
Road B	Pass.	17	34,000		
	Frt.	68	91,800		
	Sw.	72	61,500		
		157	187,300	542,367.00	2.90
Road C	Pass.	4	5,400		
	Frt.	48	64,800		
	Sw.	37	25,140		
		89	95,340	82,767.00	0.87
Road D	Pass.	6	7,200		
	Sw.	48	48,750		
		54	55,950	167,794.00	3.00
Road E	Pass.	31	51,700		
	Frt.	3	6,000		
	Sw.	87	87,000		
		121	144,700	500,668.00	3.46
Road F	Pass.	34	68,000		
	Frt.	44	59,400		
	Sw.	20	17,980		
		98	145,380	481,143.43	3.31
Road G	Pass.	44	83,000		
	Frt.	16	86,400		
	Sw.	87	52,900		
		147	222,300	628,662.00	2.83

Lubricating Oil Salvage

Most railroads are reclaiming lubricating oil from Diesel units, although the practice of reusing the oil varies somewhat. It is possible to reclaim for about 25 per cent of the cost of new oil. However, by better filtering processes in the Diesels, it now seems possible to run lubricating oil 200,000 or more miles without a change, except for dilution either by fuel oil or water, or because it is showing extensive carbon or sludge. For this reason no enlargement of oil salvage plants is recommended without careful consideration.

For those who are securing penetrating oil as a by-product of lubricating oil salvage, we recommend its use for coating car and locomotive castings. The balance can be used as fuel.

Packaging Diesel Parts

Some manufacturers are advocating shipment of all material in cartons, each to come in its own standard package. This is a good idea and care should be exercised to see that orders are made in the correct multiple. The material should be kept in the storehouse in the original cartons or packages, which will eliminate considerable loss from corrosion. However, such items as blower motors, crank cases, crank shafts, water pumps, governors, fuel pumps, etc., which will probably come in wood crates, must be kept under cover to protect the fine machine surfaces.

The heavier items, such as traction motors and generators, should be skidded to facilitate their movement. Fork lift trucks are recommended for handling items of this kind. The small items can be handled in the same manner as steam power parts.

Due to the large quantity of lubricating oil used, requirements can best be met by the use of storage tanks so that advantage can be taken of purchasing oil in carload lots. The actual distribution of oil is much easier if it can be piped to the point of use in the Diesel shops.

Warranty Material

This committee recommends the adoption of a uniform and simplified method of handling the return of material to the builder, irrespective of whether it is "repair and return," or comes under the warranty. Some firms have suggested that warranty material be inspected by the stores and mechanical departments at the repair point where it is removed, and decide upon the credit to be allowed, scrap credit set-up, and the material disposed of as scrap. This method has many disadvantages, some of which are as follows:

The order number on which the replacement material is to be secured must be shown. This would not be possible at outside points. Unless men were trained for this inspection at each point, considerable extra traveling would be entailed. Otherwise, too many personal opinions would be involved and the difficulty of securing proper warranty credit would be increased. Scrap credit which would have to be allowed in the field offers some difficulty, inasmuch as ferrous, non-ferrous scrap and some items containing both would be involved.

We feel, therefore, that better control of warranty material can be maintained by channeling it through one point where trained store and mechanical department men can pass on it.

Obsolete Material

With the rapidly changing power set up, great care must be exercised that surplus and obsolete material be returned to the builder quickly and in good condition. This requires close cooperation with the using

* Asst. General Purchasing Agent, Atchison, Topeka & Santa Fe.

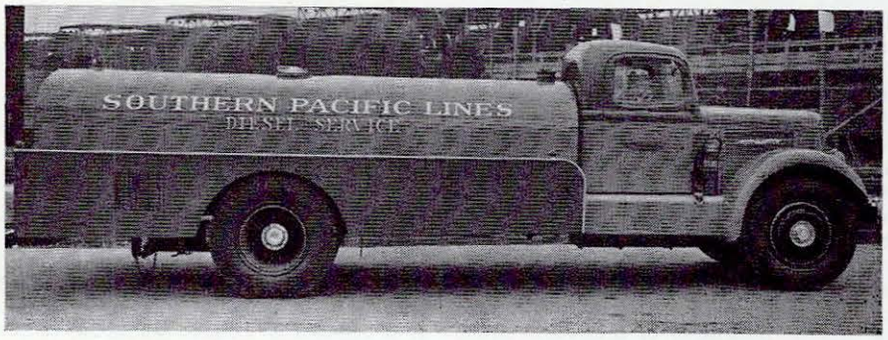
department. Ample notice should be given by the mechanical department of all changes of standard so that stock may be cleared.

The attention of the mechanical and operating departments should be called to the difficulty of maintaining adequate stocks of repair parts at division points where more than one make of Diesel switcher is maintained, and, except in special cases, the practice should be discontinued.

If the cost of repairs per mile on Diesel locomotives is to be reduced, it is necessary to watch the stock, take advantage of quantity discounts, check closely on material removed, in order that it be re-utilized and see that a fair credit is secured on warranty material.

Above—Lumber stacker permits unloading packaged lumber direct from open cars.

Below—Mobile Diesel fueling and servicing unit



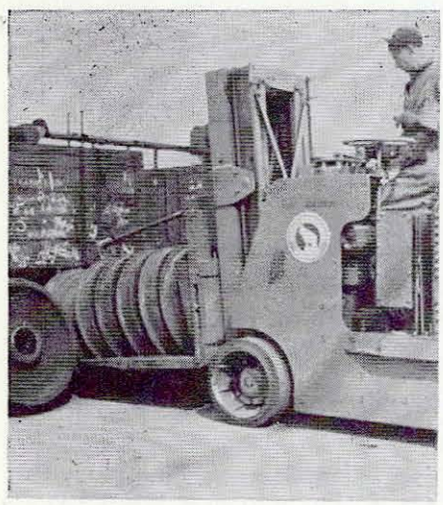
Material Handling Facilities

*By N. B. COGGINS, Chairman**

Where volume of work justifies as much as 50 per cent of full time operation, and where facilities permit the use of power and hand lift trucks without extensive capital expenditure, it is the opinion of this committee that the purchase price for such equipment can be liquidated in not more than five years by direct payroll savings. Hand lift trucks are recommended for small points, and at main storehouses in short movements, where their use will relieve power trucks for other work.

Off-Track Cranes—The off-track type crane, either crawler type, pneumatic tired or solid rubber tired, in varying capacities, has many uses and where the volume of work is sufficient it will effect a sizeable payroll saving. The pneumatic tired or solid rubber tired models can be more successfully operated over a well designed system of concrete roadways. The storage of material adjacent to such roadways makes possible a more satisfactory method of handling. Detailed studies of the operation of this equipment indicate a payroll saving up to 20 per cent of the investment cost per year.

* General Storekeeper, Southern.



Lift truck with car wheel handling attachment

Highway Trucks — This committee finds, that in addition to handling material and supplies in a routine way, highway trucks are more and more being used for other services; such as, transporting men and material to disabled equipment on line of road, pick-up of damaged freight on hand with consignees, the delivery of material in emergencies on line of road, all of which effect substantial labor saving and afford more efficient service.

Lumber Stacker and Carrier—One member road reports the satisfactory use of a lumber stacker and carrier. A distinctive advantage in this type equipment is that it permits receiving packaged lumber in open cars, permitting bulk unloading. This type of facility is also effective in handling bars, shapes and tubes, and other miscellaneous lengthy and unwieldy materials. One specific comparison has been made in the use of the lumber carrier in handling one car of lumber. It developed that the machine operated by one man in one hour performed the same service that formerly required 60 man-hours to handle manually.

Hydraulic Lift Gates—Several types of hydraulic lift gates are available to be applied to the conventional highway truck, at a nominal cost. These devices permit one man to load and unload heavy material, such as filled barrels, heavy castings and many other items that would normally require two or more men to handle. They are especially helpful when transporting heavy material over long distances, in that they eliminate the necessity of carrying an extra man to help in the loading or unloading. It is estimated that the labor saving through the use of this device will run as high as 50 per cent of the investment cost per annum.

Compartment Tank Cars—Some roads report the conversion of ordinary tank cars into four compartments, each compartment having a capacity of 2,000 to 2,500 gal. In transferring oil from main storehouse to outlying points, this type of car avoids the excess labor and leakage experienced in handling such shipments in metal barrels. This tank car is equipped with a small electric pump with a connection to all compartments and with a plug-in cord to plug in at points of unloading.

Snow Removal—Fibre rotary brooms in various widths and designs for removing snow and sweeping roadways and platforms may be purchased at a nominal cost, with a power take-off attachment and necessary couplings for attaching to ordinary tractors of standard makes. The brooms operate in front of the tractor and have proved successful in removing unpacked snow from concrete roads and platforms. They may be used also in sweeping roadways and platforms. The time required to attach and detach the broom from the tractor is less than 45 min. for both operations. Concrete roadways can be successfully

Lift truck storing arch brick on wood pallets

swept at a speed ranging from 4 to 5 m.p.h., thus effecting a substantial labor saving.

Mobile Diesel Fueling Unit — One member road reports the use of a mobile diesel fueling and servicing unit which consists of a tank divided into two compartments and mounted on a truck chassis; one compartment provides for approximately 1,200 gal. of fuel oil and the other for about 150 gal. of lubricating oil. Provisions have been made also to carry dry sand and tools for making light repairs. This facility has proved satisfactory around large terminals in meeting switch engines at convenient locations, where they are fueled and serviced, thus avoiding the need of hostler service and lost locomotive-miles resulting from bringing them to the terminal for servicing.

Laundry Service—Several roads have reported the operation of company-owned laundries for processing dining car and other miscellaneous linens. It is believed that such operation will not only show a substantial saving over the price paid commercial laundries but in adidtion better service and longer linen life is indicated.

Cleaning Oil Barrels—With the use of tank cars and compartment tanks, there is still a need for many metal barrels in the handling of miscellaneous oils, particularly lubricating and other oils in connection with Diesel operation. Contamination must be guarded against at all times, which indicates the need for satisfactory cleaning and drying facilities. The system should consist of a series of sprays to permit flushing the dirty barrels with a cleaning solution at proper temperature, after which they should be steam or air dried to remove all moisture. There are a number of methods and plans for such a facility, and it is recommended that each road contemplating the installation of such a device, explore the features of each.

Pallets vs. Skids—Due to comparative cost, it is recommended that wherever possible pallets be used instead of skids. In making this suggestion, we are aware that both pallets and skids are performing excellent service. It is the thought of this committee that many bulk shipments can be made satisfactorily on pallets, with steel strapping where necessary, and that the load remain on the pallets until used.

Diesel Fueling Facilities—Some roads report the installation of facilities for pumping Diesel lubricating oil direct from storage tank to the crank case of a locomotive, and with a reverse arrangement for pumping old oil from the crank case to the dirty oil tank. Where Diesel equipment is serviced in volume, it would seem that this method of handling would not only be practical, but would also show a substantial labor saving.

Research and Conservation

By ***S. A. HAYDEN, Chairman****

A study has been made to determine the possible benefits that might accrue to the railroads from an exploration of the manufacturers' field in search of new items of value, plus the expanded use of methods and materials found to be economical on some railroads, but which have not been utilized by all roads.

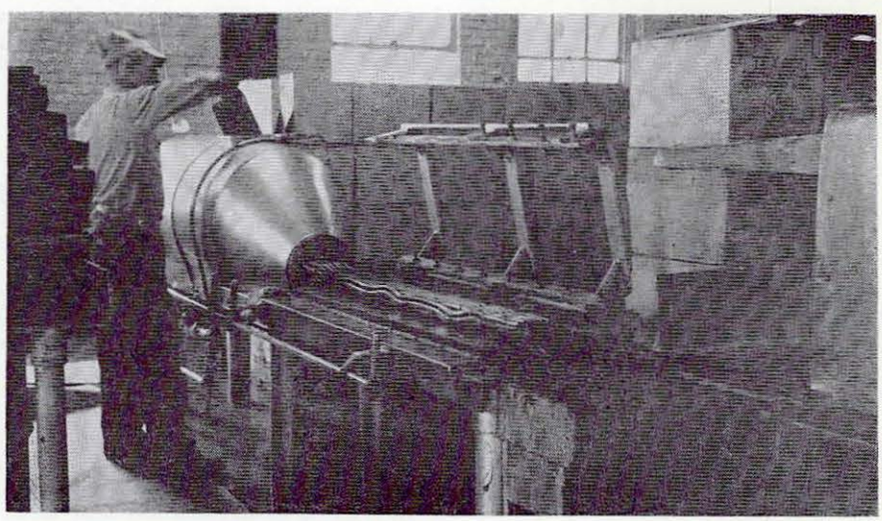
* Purchasing Agent, Missouri-Kansas-Texas.

Aluminum—War-time developments in the use of aluminum and foundry application practice commend to the railroads a further study of the extended use of this material in competition with light-weight and corrosion-resisting metals now offered. Its use for such purposes as passenger car center sills, side sills, body frames, side sheathing, roof trusses and other structural work in engine houses and buildings, and also for smoke jack and blowers, indicates possible economies.

Preventing or Reducing Flat Wheels—A number of devices have been designed to prevent or retard the sliding of locomotive wheels during braking. Manufacturers claim these devices provide more effective braking and that wheel slippage is instantly detected and corrected, resulting in a reduction in the number of flat wheels caused by sliding. These devices are now used by a number of railroads on high speed passenger trains. Considering the apparent safety factor and economies in longer wheel life which may result from more general use of these devices, the committee feels they are worthy of further study.

Plywood—Many new developments have been made in plywood as a result of war-time research. This material is now available in many forms, such as a thin veneer of natural wood banded to metal sheets and plates, thus furnishing a light yet extremely strong panel and in decorative colors and patterns. Plywood has been used with success by railroads for many purposes in buildings, in passenger car construction, etc. Some freight cars built of plywood have been in operation several years. It is reported that they were less expensive to build and have cost less to maintain; also the weight per unit has been reduced several thousand pounds.

Color Dynamics—Several railroads are experimenting with color dynamics in their interior decorative treatment or color schemes for shops, offices, etc. In employing brighter and more pleasing colors, it is



Pressing rod sticks at a central plant assures a more uniform method and promotes efficiency

claimed that personnel is relieved of mental and physical depression, attendant with drab and monotonous color schemes which lack background and contrast.

Since color has a profound effect on the human eye and nervous system, your committee feels that any improvements in decorative treatment in railroad shops, offices, etc., which will result in greater efficiency, less material spoilage and better working conditions, definitely contributes to conservation and economy in operation.

Inspection Methods and Devices—Exacting demands of the Army and Navy during the war caused many changes in methods of inspection and devices for the detection of defects in materials which may prove of inestimable value to the railroads in the future, including such methods as X-Ray, radio activity, etc. Many railroads are now employing such methods in their shops and laboratories in an effort to detect fractures or cracks in metal that cannot be seen with the naked eye; and this practice is expanding rapidly.

Removable Protective Coatings—As an improved practice for investigation, attention is directed to new plastic coatings now available to protect finished parts in storage. This material can be applied by spray, brush or dipping, forming a tough, impervious skin on the coated surface, which is resistant to oils, water, acids or alkalis. It is removed easily when the part is to be used.

Boiler Coatings—Several railroads report using prepared boiler coatings as a preventative against pitting, corrosion, and caustic embrittlement in locomotive boilers. Its use retards adherence of scale to boiler, reducing labor expense at flue renewal periods. While this material provides protection against corrosion when boilers are in service, some railroads report it to be particularly effective as an out of service protection.

Stationery and Printing

*By GEORGE E. PERROT, Chairman**

Annual expenditures for stationery and printing by Class I railroads from 1926 to 1945, inclusive, were as follows:

1926	$28,418,710	1936	$14,011,000
1927	26,840,000	1937	16,431,000
1928	25,638,000	1938	12,958,000
1929	25,567,000	1939	13,915,000
1930	20,300,000	1940	14,502,000
1931	18,500,000	1941	17,616,000
1932	14,400,000	1942	19,727,000
1933	11,628,000	1943	20,258,000
1934	12,884,000	1944	22,314,000
1935	12,334,000	1945	22,555,000

It is the consensus of this committee that the returns to the Bureau of Railway Economics are not being uniformly prepared by the railroads, partly because of the fact that the Standard Material Classification—Class 48—Stationery and Printing, prepared several years ago, does not embrace all the items used by the railroads at present. Therefore, a subcommittee was appointed to meet with the Material Classification Committee for the purpose of revising the list of materials to a current base. A better picture of annual stationery expenditures will be possible if future returns by Class I railroads are revised to include advertising printed matter and rental of equipment, such as tabulating and recording equipment, etc., and the reports, beginning with 1946, be supplemented with a reference mark to this effect. Therefore, it is recommended that the Bureau of Railway Economics request all Class I roads to base their future returns for Class 48—Stationery and Printing—on the latest revision of the Standard Material Classification and to include advertising printed matter and equipment rentals.

* Stationery Supervisor, Seaboard Air Line.

Standardization of Sizes

We again repeat the importance of further consideration by those roads not using 7½ in. by 9½ in. plain papers and printed forms, not only for the substantial monetary savings that are possible, but the salutary effect on paper pulp consumption which is so important at this time. Had there been a general adoption of this standard size by all railroads as recommended several years ago, it would have proved most helpful in relation to the paper shortage we are now experiencing. A saving of 23 per cent is possible with the reduction from 8½ in. by 11 in. to 7½ in. by 9½ in. for plain paper and a proportionate saving for the following items: Printed letterheads, second sheets, mimeograph paper, carbon paper and smaller envelopes can be used where 8 in. by 20½ in. and 8½ in. by 11 in. have been used previously.

It is also important that the half size sheet 4¾ in. by 7½ in. be used more generally for short communications, second sheets for above, scratch pads and telegram blanks (unprinted).

Standardization of Quality

We urge railways to continue the general use of papers where the manufacturers' base is of ground wood, such as low sulphite, manilas and hard sized news, for interdepartmental correspondence and printed forms. This practice will not only effect considerable savings with satisfactory results but will greatly relieve the present critical paper situation.

Unit Bill of Lading

For full specifications and recommendations regarding the use of the Unit Bill of Lading, please refer to the A.A.R. booklet, dated September, 1944, submitted to member roads by the executive vice-chairman on October 2, 1944 (Accounting Division Form AD-129). Several member roads have made extensive use of this form, others advise limited use at large stations, while others are considering its use but have not approved trial. It is believed that, with proper promotional work towards soliciting the cooperation of shippers in adopting this dual form, it will greatly assist the railroad in expediting freight shipments.

Standardization Committee

It is recommended that the Standardization Committee on each member road redouble efforts in reviewing forms and statements. The issuance of a questionnaire to departments to determine the need of various forms may simetimes result in their discontinuance; may effect consolidation of others, and may bring about a reduction of the space on all forms to sizes actually required; may eliminate copies not deemed necessary; permit the adoption of minimum grades and substance weights, and effect monetary savings well worthwhile.

Standardization of forms common to all member roads, particularly waybills, bills of lading, interchange reports, etc., should be progressed by future committees. Much preliminary work can be immediately performed in this direction, where the general offices of two or more railroads are located in the same city.

Tariffs—At locations where a passenger or freight traffic association serves a group of member roads which are not under supervision of a purchasing committee, it is recommended that arrangements be made for appointment of such a committee for handling association purchases of all tariffs, other printing, office equipment and all supplies that may be required.

Tickets—The passenger departments of all member roads are urged to give immediate consideration to reducing the size of coupon tickets to actual requirements when it becomes necessary to replenish stock. Full cooperation between passenger association and purchasing departments will not only effect considerable economy, but will conserve the high grade bonded stock used for coupon tickets. Some roads have realized a reduction of 25 per cent through these measures.

Waste Paper—The paper situation today is more serious than during the war years. Therefore, all member roads should strive more than ever to salvage waste paper. Every consideration should be given the destruction of records in accordance with I.C.C. regulations, clearing files of obsolete correspondence, bailing waste basket accumulations in the general offices and also from other offices, for sale through regular channels.

Micro-Filming—In addition to microfilming of essential records for safekeeping, considerable progress has been made by certain roads in the filming of records, through the use of various types of equipment, both in the general and division offices, especially since permission has been granted some roads by the I.C.C. to destroy certain original records that have been filmed; and courts are now accepting reproductions of these records in lieu of originals. This practice also conserves valuable storage space. Several member roads are now micro-filming waybills, passing reports, etc., at large stations, which expedites the handling of freight and has effected certain economies. Therefore, the committee suggests that all member roads give this subject due consideration.

Central Mailing Bureau—There are numerous advantages to be derived from the establishment of a central mailing bureau, where a number of departments are located in the same building or adjacent buildings. The receiving of mail through one source not only expedites, but insures prompt delivery to the proper department of mail not properly addressed. The forwarding of mail through such a bureau conserves envelopes and effects postage savings. Some roads have advised that the use of chutes or tubes, where many departments are located within one building, has proved very satisfactory.

Forest Products

*By E. H. POLK, Chairman**

For the duration of the war, lumber was one of the most critical items and at no time was there enough to meet both war and domestic needs. The government, realizing that with increasing labor and equipment shortages, lumber production could not be increased to meet all demands, stepped in, and by various controls proceeded to channel production where it was needed most. The direct war needs were supplied first, then industries essential to the prosecution of the war, in which classification railroads were placed, and finally the general public.

The national war-time picture on all forest products was one of restricted supply and controlled prices. The ceiling prices attempted to take into consideration differences in species, stumpage and labor, and regional conditions were given recognition by controls of regional designation; thus a balance as a whole was preserved. However, the inherent inequalities in production and geographic distribution of industry were such that certain parts of the country experienced more difficulties and encountered different obstacles and problems. This applies particularly to widely separated segments of our railroads.

Railroads were required to maintain and present periodic inventories, submit estimates of their requirements, and to report the size of order files. The administrator, by refusing to release orders, had the power to take railroads out of the market as a whole, or on any of the six classes of lumber specified. This strict regulation of lumber supply worked to the advantage of the railroads. With a minimum of competition from the general public and a priority second only to that of the military, railroads were able to secure delivery of their certified orders.

Despite the fact that railroads, assisted by allotments and priorities, were in a comparatively favorable position and enjoyed a favorable price mark-up, they were faced with certain difficulties which even these advantages could not overcome, and there developed an acute shortage of certain lumber items which lasted throughout most of the war. Among these items in different categories and different species were clear lumber, large FOHC (free of heart center) timbers, common boards, and dimension; the latter two were in heavy demand in the last stages of the war for boxing and crating. Switch ties were scarce because a large percentage of this production was diverted to lumber.

* Purchasing Agent, Southern Pacific.

Scarcity of Car Lumber

The shortage of clear lumber and FOHC timbers may be attributed, first, to the diversion of high-grade logs to the plywood industry which expanded tremendously during the war period, and, second, to the fact that the remaining good logs were cut into lumber requiring the least remanufacturing and handling. As a result, the railroads were unable to secure sufficient supplies of ceiling, roofing and clear framing and were at times hard-pressed for car lining, siding and sheathing, which came into direct competition with lumber used in large quantities for ship-decking.

While the railroads were hard pressed, somehow, sufficient supplies of lumber and ties were secured to maintain operation. To accomplish this, purchasing, stores and using departments were required to make many adjustments in their specifications and buying practices. Grade spreads were liberalized on practically all types of lumber, a higher percentage of boxed hearts were accepted as structural timber, more random widths and lengths were permitted, and substitute species were obtained.

The drying up of crosstie production in the Douglas fir area, the critical switch tie situation throughout the entire country, and shortage of mainline crossties in the eastern area have been matters of serious consequence to the railroads, with no solution in sight until the competitive position of the railroads is restored by proper adjustment of price schedules. During the last two years, both in the South and West, sawmills customarily producing switch ties have diverted their production, first to war-time boxing and shipping lumber, and, more recently, to lumber for the housing program. Two by fours in eight-foot lengths are now in such demand that crosstie cutting has been diverted in like manner.

Price Structure Inconsistent

Railroads and car builders are experiencing difficulty in obtaining sufficient car lumber for maintenance requirements. Their primary concern at present is to speed repairs to box and refrigerator cars badly needed and to obtain delivery as promptly as possible of new cars on order. Investigations indicate that the shortage of car lumber is due principally to maladjustment in the price schedule. Items of car lumber, because of technical requirements of manufacture and grade, have demanded a favorable price differential as an inducement to the mills to produce them; however, this price differential was completely upset when adjustments were made on prices of comparable commercial grades without a corresponding adjustment on price of railroad grades. Mills producing railroad items have found other channels for production that will bring better returns.

The situation continued to become more critical and on January 26, 1946, a meeting of purchasing agents, western group, was called in Chicago, at which time it was agreed to present the matter of procurement of lumber, cross and switch ties to the proper government agencies in Washington, D. C., through the chairman of the special purchasing committee.

The general lumber situation and predictions for the next year or two may be described as unfavorable. Production is, and will likely be for some time, appreciably below current domestic and potential export demands.

Much of the type of lumber that would be suitable for railroad use will go into other channels, partly because of government regulations and because of more liberal orders which other buyers are able to offer. No small factor is the continued depletion of high-grade timber and the preferred price position enjoyed by plywood mills in obtaining the high-grade logs that are available. Conditions make it impossible to predict anything but an even tighter lumber supply so far as can be foreseen at this time. We must not only make the most of available material but must be prepared to use new products and new methods as well. Large structural timbers are being displaced by laminated material and plywood will replace the use of clear lumber for a multitude of purposes. Available supplies must be better cared for, better preserved, and utilized. New preservatives and seasoning methods are being developed constantly, and it will be well for railroads to determine what such treatments as chemical seasoning and chemical hardening of wood can do for them.

Recommendations

Buying Practices—It is recommended that stores and using departments give greater consideration to purchasing lumber in a manner to conform more closely with commercial practices. Lumber may be more readily available to the railroads if it can be purchased as often as possible, consistent with use, in more liberal grades and sizes. This may cause additional work in railroad yards, but may often be justified from the standpoint of procurement and ultimate use as long as the market remains tight.

Laminated Timbers—Engineering departments should investigate, through tests and study, the use of laminated lumber, a consideration which is becoming progressively more urgent with the increasing scarcity of FOHC timbers. Of particular importance are the tests of structural material with stress requirements such as bridge stringers and caps.

Plywood—The possibilities of increasing the use of plywood should be developed also for railroad use, particularly for interior and car work. The plywood industry has expanded and developed many new and improved methods of manufacture and their products are probably more adaptable for railroad use than in pre-war days.

Treated Lumber—The use of chemically treated lumbers should be investigated. New methods of treatment have been developed during the war, which are claimed to retard checking and give added life to lumber.

Care, Handling and Storage—Using

departments should study lumber conservation by proper storage and handling to prevent waste, particularly of lumber distributed and stored on the line for future work which may be delayed or curtailed. Special attention is directed to the storage of grain doors on the line from one season to another; when piled solidly they decay very rapidly. The price paid for grain doors has increased during the last few years and they should be conserved by proper care.

Mechanical Lumber-Handling Equipment — Many advancements have been made during the last few years in mechanical-handling equipment for the Army and Navy, making possible the handling of an enormous volume of material and packaging of lumber in unit loads at time of loading. These methods should be investigated as an aid in attaining economy in handling and a saving in storage space. Mechanical handling also offers possibilities of savings at tie treating plants.

Stores Organization

*By C. K. REASOR, Chairman**

This committee would like to direct particular attention to Manual Rule 20, "Control of Material Stock and Coordinating Procurement With Actual Needs." The importance of this subject is obvious and we have endeavored to further amplify this mandate by the following suggestions and recommendations, all with the purpose of promoting efficient material control.

Materials Available for Transfer—Most roads have found it more economical to move surplus materials to general stores where more efficient control is maintained and where it is easier to dispose of small quantities in regular scheduled shipments of other general stores stock. Exceptions to this practice are usually large quantities of steel, lumber, forgings, etc., which are left over from program work. This material is usually listed by classes and reported to a central point where it is checked against other program work and heavy orders for similar material, and when practical it is shipped direct to the point where needed.

Inventory Reduction and Stock Turnover—This subject is so closely related to the basic principles of good storekeeping that consideration must embrace a number of subjects. For example, proper checking of stock at stated intervals; correct entries in stockbooks or on stock cards; records of average consumption; and ordering for delivery at such times and in such quantities as the records indicate to be necessary; all these have an important bearing on stock turnover. The proper training of section stockmen, stressing the necessity of maintaining accurate stock records, is also an important factor.

Requisitions and Orders—Many committees have previously urged the adoption of the requisition-order form and its use has greatly increased, but some roads still prefer the old plan of writing requisitions, which are later copied in the purchasing department on purchase-order forms. Little more time, if any, is required to write a requisition-purchase-order than to write a requisition, thus saving the time of writing the purchase order, checking to insure correct transcription, and, more important, expediting the placing of orders with the manufacturer.

Most roads are expanding the requisition-order form to the requisition-bid-order form. One plan is to furnish the purchasing department with sufficient copies of the requisition-purchase-order at the first writing on properly headed forms to enable them to secure quotations thereon from manufacturers. On other roads a master sheet, produced with duplicating ribbon, is made at the original writing and forwarded with the requisition-order so that the exact number of copies required by the purchasing department for securing quotations may be made in that office, thus reducing possible waste of stationery.

Correspondence Filing—One railroad found recently that its filing system, established some years ago, had not been revised or amended to meet changing needs and conditions, with the result that it had become a "one man" system with too many overlapping files. For the past year this road has been experimenting with a new filing system, complying with the A. A. R. Material Classification, with regard to filing of correspondence relating to materials and supplies. This road has found the new system very effective and an improvement over other systems previously tried.

This new system does not interfere with the past practice of using the requisition-order reference for correspondence regarding material definitely placed for bid or ordered, but does provide for use of A. A. R. classification numbers for all other correspondence concerning specific items of materials and supplies. The classification numbers proper are supplemented by suffix numbers for purpose of breaking down the various classes into groups, following the alphabetical scheme in the A. A. R. Material Classification.

The primary classification number of each class is used with suffix number "1" to indicate general file, for use when more than one group of material in a class is involved in the same correspondence.

Rail Laying Program—Immediately following the formal approval of an annual new rail program by the executive department, the purchasing department places orders with steel mills for rail required. The purchases and stores department prepares a distribution program from information furnished by the chief engineer regarding the amount of rail to be replaced by various divisions each month.

The general storekeeper places purchases requisitions for angle bars, bolts, track spikes, switches, etc. Requisitions for these items specify deliveries in sufficient quantities to meet immediate program work by months, i.e., a complement for the amount of rail to be laid monthly on each division. Delivery dates on purchase orders are placed to coincide with the shipment of the rail, so that when possible, carload shipments of angle bars, tie plates, track spikes, switches, etc., can be shipped direct to the job, avoiding extra handling by stores department and backhaul. This is accomplished by receipt of advice from steel mills as to movement of rail, which information is promptly furnished the stores department so it in turn can arrange for shipment of all fittings required, in order that all material will arrive on the job at the same time.

District material supervisors, working under the direction of the stores department, are responsible for providing material in sufficient quantities to permit the rail program progressing on monthly schedule; also, when the job is completed, all material, including rail removed from track, is shipped promptly to nearest store where it is made available for second-hand rail programs and industry jobs. This supervision prevents diversion of track material to other points on the system before being forwarded to stores for proper sorting and classification.

Upon arrival at stores, rail and fittings are promptly sorted. All scrap is used by the railroad or applied on sale orders; second-hand rail and fittings are made available for second-hand rail program, which is handled along the same lines as the new rail program in that rail and fastenings are shipped from each store in such a manner that they arrive on the job at the same time.

* Assistant Manager Stores, Erie.

Simplification and Standardization

*By L. E. FIELD, Chairman**

Your committee submits the following report on subjects previously referred to other sections of the A. A. R.:

Class 18—Brake Pins and Bushings—Referred to Mechanical Division in 1940. No further development.

Class 22 — Air Compressor Rings — This committee made a study in conjunction with ring manufacturers for our 1942 report, which indicated that over 90 per cent of the total ring requirements could be met by five or six oversize diameters, and one or two oversize widths, thereby reducing stock requirements from approximately 1,000 to 250 different sizes. This report was referred to the Mechanical Division June 3, 1943, and subsequently referred to their Committee on Brakes and Brake Equipment. On August 14, 1945, they submitted the following report:

"It has been found that there are many variations on different railroads as to what the standard sizes of compressor rings should be, which indicates that the only acceptable recommendation may be that of the particular railroad involved. The committee feels this subject is a matter that should be handled between the manufacturers and their respective customers because of the wide variations in practice and opinions among the different railroads."

Class 42—Brazing Fittings for Copper Tubing and A. A .R. Valves—This

* Supervisor of Material Standards, Boston & Maine.

subject was referred to the Mechanical Division in 1945, with a recommendation that a series of A. A. R. standard brazing fittings be developed for railroad use. Such a standard should provide a foundation for a substantial reduction in the number of fittings necessary to be carried in stock. The A. A. R. Mechanical Division, after considering this matter, declined action at this time.

Current Subjects

Class 1C—Fencing—It appears that the requirements of 47 of the 60 roads answering a questionnaire sent out regarding this subject are covered by Department of Commerce Simplified Practice Recommendation R9, 1946. These 47 roads represent 113,631 miles, while 13 roads, representing 112,529 miles, report one or more additional sizes are required. With some concessions in the specification of the roads concerned (such as the use of No. 7) we believe the variety of sizes shown in the Department of Commerce SPR 169-46 is sufficient to cover railroad requirements.

Class II—Bolts and Nuts—U. S. Department of Commerce, Simplified Practice Recommendation R 169-45, covering machine, carriage and lag bolts, as revised has been generally approved by manufacturers, distributors and users and has been promulgated, effective October 11, 1945. Our Standard Material List 11-1, square neck carriage bolts, checks satisfactorily with Table IV of SPR 169-45, A. A. R. Standard Material List 11-5, square head lag bolts also come within the range of sizes shown in Table VI of this Simplified Practice Recommendation.

Table I of SPR 169-45 Recommended Stock Production, sizes of square head machine bolts, does not fully cover sizes required for railroad use. This committee has revised standard material list 11-2 to include a minimum number of manufacturers' non stock sizes. This revision is based on a study of the total number of each size of bolts reported used annually by 80 railroads. In the preparation of these lists, this committee has been guided by the number of roads reporting as using the items in question. This revision removes 51 sizes from the present list and adds 8 not previouly shown. Sizes added are predominantly for bridge service.

Class 14-4—Mechanical Steel Tubing—A recheck of this list based on results of a questionnaire indicates that it now covers sizes generally used by railroads and need not be revised at this time.

Class 15-7—One Pass Cold Rolled Box Annealed Sheets—This committee recommends this list be cancelled, as list 15-6 Steel Sheets covers present requirements.

Class 25-E—Electric Lamps—Replies from 74 railroads to a questionnaire, listing about 1,000 different lamps, have been tabulated with a view of setting up a list covering lamps most commonly used by the railroads. Our questionnaire did not include lamps for signal purposes, as Committee VI of the Signal Section is working on lamp specifications for this purpose. However, 34 roads furnished this information, and while it is probably not complete we have included lamps shown as used by 5 or more roads in our list as information only, and these will be referred to the Signal Section for further handling.

Lamps other than for signal purposes reported by five or more roads have been included in the proposed standard material list which we recommend be printed in loose leaf form for distribution to member roads.

Standard Stock Numbers—In connection with this subject, it will be noted that manufacturers' stock reference numbers have been included on recommended stock lists 25-E 1 and 25-E 2. For some years there has been a discussion of a standard stock reference for railroad materials. This list affords opportunity to test the idea. Code numbers shown are commonly recognized by lamp manufacturers and have a definite meaning. One manufacturer will soon be producing lamps with the code numbers etched on the bulb.

Class 36-A-2—Brooms—As a revision of this list, your committee presents a proposed uniform specification for brooms which we recommend be adopted. General use of the uniform specification will enable manufacturers to produce brooms during slack season with assurance of a market and insure better delivery than under present conditions with numerous specifications showing only slight difference.

Class 36-A-3—Mops—Your committee also presents a proposed uniform specification for mops. We believe use of these specifications will secure better mops than those now generally secured. We therefore recommend its adoption.

Class 42 — Butt Welded Pipe Fittings—As these fittings are a comparatively recent development and have been used by railroads to a very limited extent, we recommend this subject be referred to Committee 23 for further study and development.

Class 42—Soldered Joint Fittings—As the conditions regarding the use of these fittings are the same as those applying to butt-welded fittings, we recommend the development of this subject be referred to Committee 23.

Class 47-2 — Paint, Varnish and Cleaning Brushes—During the war it was impossible for brush manufacturers to furnish brushes in accordance with A. A. R. Specification M 911-39 because Tsingtau and Tientsin bristles could not be obtained from North China, and substitutions were made for soft and medium soft bristle. Substitutions were also made for the stiffer bristles, such as Chungking and Hankow bristles.

These bristles are now being received and there is also a good quality of suitable bristle available from South America. The price on the latter is out of line as compared with bristle received from China, and it seems unnecessary at this time to include this bristle in the specifications. Available information indicates it is doubtful if Russian or French bristle will be available, which fact does not justify modification of the specifications, as there are other suitable bristles mentioned in the specification as a substitute which are obtainable.

Manufacturers and consumers at present are giving serious consideration to Nylon paint brushes. These were used extensively during the war by the Navy and found satisfactory. No doubt further development along this line will justify a revision of the specification and standard material lists. Increased production of Nylon brushes will have a tendency to reduce cost. They are now more or less in the experimental stage. The wear on a Nylon brush is practically negligible; however, because of the character of the bristle, it lacks the quality of absorption. To overcome this the bristle has been manufactured with a taper and with a slight permanent wave effect. No doubt Nylon brushes will be used extensively and must be given due consideration because they can be produced at present for about one-half the price of a good bristle brush manufactured to A. A. R. specifications. This committee recommends no change in Standard Material List Class 47-2 or in A. A. R. Specification M 911 at this time. As the Nylon bristle presents a new material, worthy of consideration for future railroad use, we recommend Committee 23 be instructed to follow its development.

Report on Fuel

*By M. H. McGLYNN, Chairman**

As a result of unsettled labor conditions railroads and other large consumers have been forced to draw on their stored coal supplies, with the result that stocks generally were almost exhausted early this year. However, during February and March most roads were able to resume storing so that supplies on hand were increased to from three to six weeks' supply when the coal miners' wage contract was terminated on March 31, 1946.

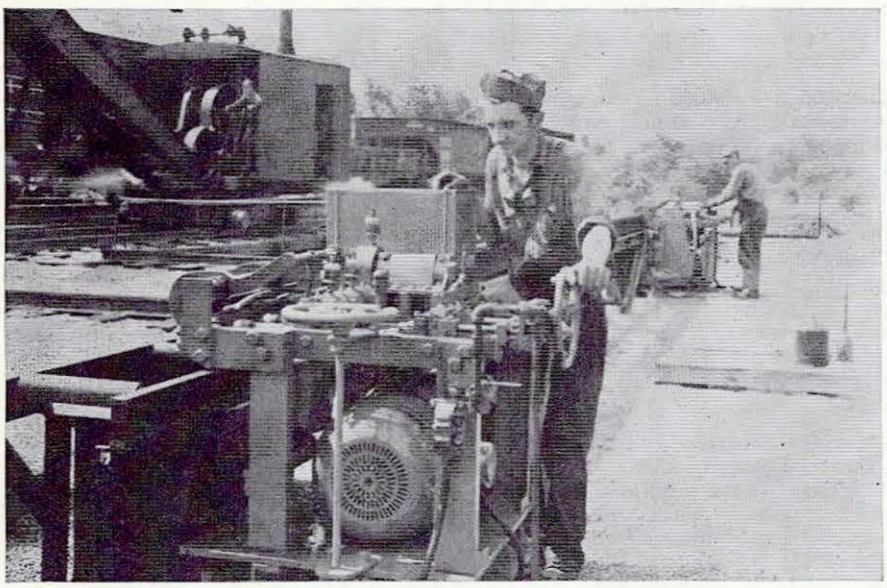
There have been two general price increases in coal recently. With the signing of a new wage agreement, the O. P. A. authorized increases averaging 16 cents per ton for the country as a whole on May 1, 1945, and on August 1, 1946, additional increases were allowed, averaging approximately 3 cents per ton. The Solid Fuels Administration has relinquished many of its controls and is expected to discontinue its existence in the near future.

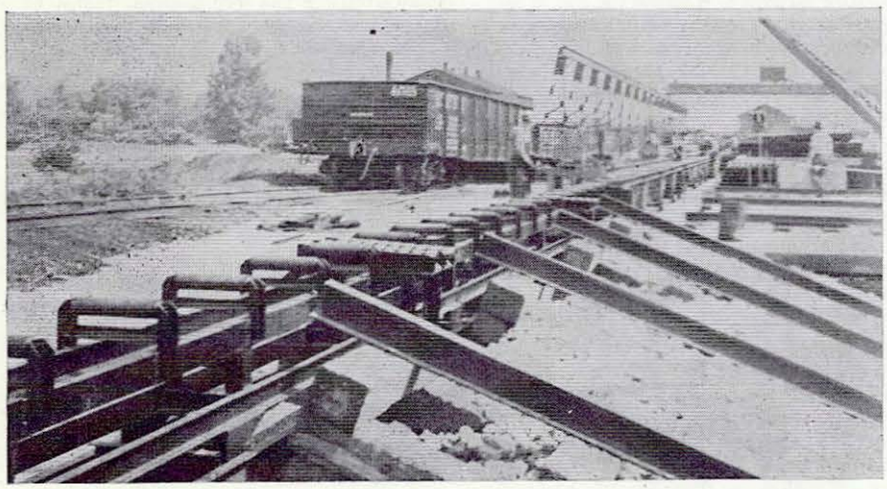
Fuel Oil and Diesel Fuel Oil

Early in 1946 a serious shortage developed in Navy and War Shipping Administration heavy fuel oil requirements which resulted in: (1) Diversion of fuel oil to Navy and W. S. A. requirements, resulting in curtailment of supply of oil available for railroad use, particularly on the Texas and Louisiana Gulf coast. (2) O. P. A. ceiling prices on residual fuel oil were increased 21 cents per barrel in all areas, except the Pacific coast, where an increase of 15 cents per barrel was made, effective March 18, 1946. The greater portion of these increases has been passed along to the railroads covering deliveries from their regular sources of supply.

* Fuel Agent, Chicago, Rock Island & Pacific.

Above—General view of a modern rail reclamation yard designed to process an average of 10 to 12 rails per hour. Below—Drill stand equipped with multiple heads for drilling three bolt holes simultaneously





Roll conveyors deliver the rail to receiving pit after the reclaiming process is completed

There was a large increase in the consumption of Diesel fuel oil and a slight decrease in the consumption of coal and fuel oil in steam locomotives, as shown by the accompanying table.

	Coal (Net Tons)	Fuel Oil (Gallons)	Diesel Fuel Oil (Gallons)
1945 ...	115,048,842	4,379,241,545	418,703,820
1944 ...	123,636,459	4,482,156,204	290,107,271

It is expected that the consumption of Diesel fuel oil will continue to increase, but, while refinery crude oil runs have decreased somewhat, there has been no shortage of Diesel fuel oil of suitable quality, and no shortage is anticipated.

The proposed specifications for fuel oil included in the 1945 report of your committee have been referred to our Mechanical Division.

General Reclamation

*By T. S. EDGELL, Chairman**

With the increased use of Diesel-electric locomotives, improved signaling, telegraph and telephone, reclamation is practically an unexplored field and those having charge of reclamation on the railroads should be alert to the many possibilities presented. Scrap yards should be checked carefully at regular intervals, seeking out the possibilities of reclaiming material that has been discarded as being unfit for further service on the equipment or devices from which it has been removed.

Those having charge of reclamation should approach the subject with the thought in mind that reclamation possibilities are only corcumscribed by the extent of the imagination. The committee particularly recommends that the investigation of repairs and recovery of Diesel locomotive parts be given close study.

Brake Beams

Your committee is in favor of using new truss rods or tension members in all repaired brake beams. Some expensive derailments have occurred due to a tension member breaking, permitting the head to come off and dislodging the beam from the support, thus permitting it to unravel and cause a derailment.

On one railroad extensive tests have been conducted on brake beams by means of a machine designed to simulate actual service conditions. These tests show that brake beams installed with old tension rods in numerous cases give less than 25 per cent of the service of those having new tension rods. This matter was referred to the mechanical section of your committee with the suggestion that if the manual is changed to make the effective use of new truss rods or tension members, the Mechanical Division give serious consideration to the revision in price of brake beams under A. A. R. rule 101, items 212 and 213.

Reclamation of Rail

In the 1945 report of the Committee on General Reclamation there was a brief

* District Storekeeper, Gulf, Mobile & Ohio.

description of facilities required for reclaiming rail. One of our member roads has made a recent installation of rail yard machinery, which consists of the following facilities:

1 Shock roll conveyor and stand.
3 Standard roller conveyors and stands.
1 Roll conveyor equipped with jacking stand and side discharge conveyors.
2 Home-made drill stands equipped with multiple heads for drilling three holes at once. These are located 36 ft. apart to accommodate cropped rails, drilling 6 holes simultaneously.
3 Stock pile foundations.
1 Charging rack.
1 Receiving pit.
1 Acetylene cropping machine equipped with two machine cutting torches and tips.
1 Ditcher crane and running track for unloading and loading rail.

Operating Procedure

(a) Rail is unloaded at stock piles (capacity three cars) or direct to the charging rack with crane; (b) it is then skidded from charging rack to receiving conveyor; (c) scraped clean at the base and web about 18 in. from the inside bolt holes of each end; (d) the rail is then moved forward to the next position where 18 in. is burned off by cutting the ball and half way through the web, then cutting the base and half way through the web; (e) it is then moved forward to the next conveyor and the opposite end cut off by torch; (f) while in position, the cut end is ground with electric grinder with flexible hose to remove burrs and high spots where torch cuts meet. Rail end is also bevelled at this time; (g) the rail is then moved forward to the next conveyor, where drills are located at each end, and the other burned end is ground. It is then pushed to a fixed stop, attached to one drill stand, and lined to the other drill stand where slight adjustments in length can be made; (h) it is next moved forward to the jacking stand where it is lined for the receiving pit, discharged by releasing jack and exerting pressure sideways, and moved on cross conveyors to pit. This work is accomplished with the air jacks; and (i) rail is then loaded by crane from the pit where it has accumulated in tiers.

Water Column Parts

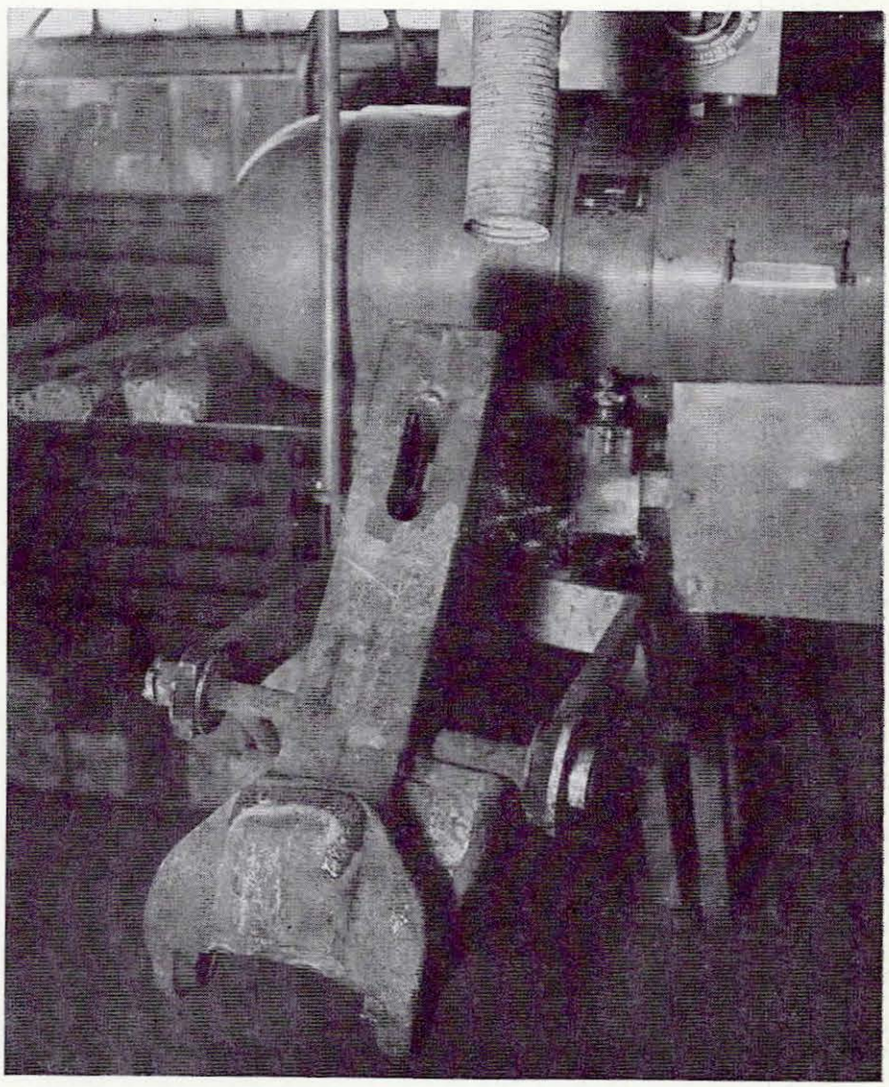
Water column parts are a class of material that should be given serious consideration for reclamation, and railroads who are following this practice closely have found that a substantial saving can be effected. As an example, it has been found on one road that various parts of water columns can be successfully repaired.

Couplers—Since the extension of welding rules, coupler reclamation has reached a volume where special handling equipment for reclaiming is justified. There is a coupler positioning or welding jig which has materially reduced the work of the operator in conjunction with proper welding. The coupler can be placed easily in welding position, thus increasing the production per man hour.

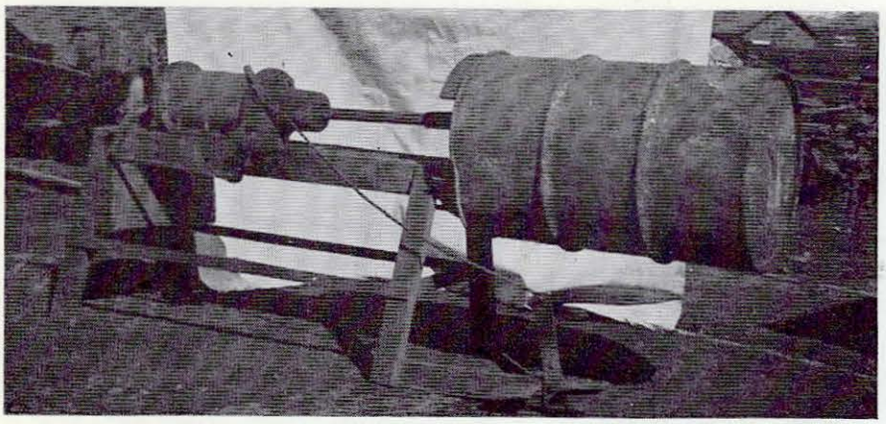
Brake Levers—It has been found more economical in reclaiming brake levers to weld steel plugs in the worn holes and redrill.

Acetylene cutting machine used for cropping rail ends

Brake Hangers—A saving can be effected over plugging and drilling holes in brake hangers by making a suitable jig



Welding jig used to hold coupler knuckles in welding position



Air expanding mandrel for straightening oil drums

to hold brake hangers in position, building up worn sides of holes with an acetylene torch and drifting the holes to proper diameter while hot.

Conduit Fittings — Since steam heat conduit fittings are used on all passenger equipment, considerable savings can be made in the reclamation of these items. One road has developed this feature of reclamation extensively, and has found that, by using this method, the cost of repairing conduits has decreased an average of 18 per cent.

Straightening Drums and Cans — A device has been developed by one railroad for straightening drums and five gallon cans. In operation, the barrel to be straightened is placed on a mandrel, a foot lever actuates the air cylinder, and a piston spreads the two circular halves. The barrel is then tapped with a mallet, pressure is released and the barrel given one quarter turn; it is tapped again, and the operation is completed.

Cooperation—In the development of reclamation practices the complete cooperation of using departments is becoming more evident each year as these departments recognize the service that may be rendered and the savings that may be effected.

Scrap

*By P. YOUNG, Chairman**

During the war years, the railroads were called on to exert every effort to locate and deliver all available scrap to consumers, not only from the regular source of supply from general maintenance and repairs, but all material held in stock for future use was checked closely and any item which could not be used in a reasonable time was placed in the scrap heap. Abandoned lines and facilities were checked and, if not needed, were consigned also to the scrap pile.

Since the end of the conflict, demands for scrap for reconversion have continued strong and, from all indications, will continue so for some time. Your committee is of the opinion that the railroads have considerable equipment which was pressed into service during the war to meet transportation demands, and which will eventually be discarded when they again operate under normal conditions. Most of this equipment will be dismantled and sold as scrap, and the program of dismantling and preparing this equipment for sale should be carried out as soon as it is turned over to the department assigned to that work, not only to meet consumer demands, but also to take advantage of present ceiling prices.

We must consider also our best market in conjunction with the shortest haul, since scrap is no longer allocated and the demand is still critical. In many cases ceiling prices can be received at various points along our respective railroads, and hauls should be made to the nearest point paying such ceiling prices.

Shearing vs. Gas Cutting

It was agreed by the committee that both the shearing and gas cutting method of preparing scrap has its merits, and your committee recommends the use of shears where possible in preparing scrap for classification, as this method would be more economical, except, of course, in remote cases where heavy torch cutting is done and a few rods or bars are in that vicinity. The use of corrugated blades or shears is also recommended as a safety feature to prevent slipping.

A discussion of the merits of centralized scrap handling versus handling at point of origin indicated: (a) one railroad handling at various points of origin, (b) one railroad handling at 6 points of origin, (c) one railroad handling at 3 points of origin, and (d) eight railroads handling at centralized points. The roads handling at centralized points were constantly watching items which required no preparation or re-handling, and which are being sold direct from point of origin. Your committee believes there are possibilities for further efficiency and that items which can be handled direct should not be shipped to yards.

Sorting of Scrap—Your committee recommends further study of the methods of sorting scrap by spreading on ground or laying in furrows, as it has possibilities over the old method of pulling pieces from large piles of scrap which became entangled, thus making sorting difficult and costly. A discussion of the sorting of non-ferrous scrap at point of origin indicated that the railroads represented on this committee are endeavoring to sort this class of scrap and ship to destination unmixed with foreign materials, as this has proved helpful in sorting at destination. It is recommended that railroads exercise constant care in this matter, in order that scrap material loaded for shipment to central points for sorting is confined to metals; and such items as reels, drums, burlap and carpet should not be included, as these have a tendency to increase the cost of handling.

Cost Formula—It is recommended that further study be given this subject with the object of arriving at a suitable standard.

Scrap Arbitration—No cases were presented for consideration during the past year. We recommend the submission of cases wherever possible.

Safety at Scrap Plants—It is desired to emphasize further the importance of education in relation to safety rules, so that all employees are thoroughly familiar with all rules and instructions relating thereto.

Dining Car and Commissary Supplies

*By J. F. McALPINE, Chairman**

Committee reports of previous years have clearly indicated a tendency toward placing commissary supplies under the jurisdiction of the purchases and stores departments; as these departments are staffed with highly specialized personnel, qualified and experienced in the application of standard purchasing and storekeeping practices. Your committee is of the opinion that the same benefits now derived by those roads which handle their commissary supplies through the purchasing and stores departments can also be attained by other roads if handled in the same manner; and it is our recomdation that the benefits derived from handling these supplies in this manner be brought to the attention of the proper executives, and its adoption be recommended for those roads not following this practice.

Headrest Covers — Napkin-type headrest covers made of cotton or linen are more economical than the hood-type covers. The former require less goods and machine work, reducing the cost considerably. They also can be laundered more cheaply than hood-type covers. Many railroads have adopted single napkin-type covers as standard equipment, primarily for economical reasons.

Linens—Heavy canvas baskets are necessary for the proper care and protection of mangled linens transported from commissary to cars or various places on the railroad. Baskets are preferred as canvas bags crush and muss finished laundry while

* Supervisor of Scrap Reclamation, Atchison, Topeka & Santa Fe.

* Assistant Purchasing Agent, Chicago, Burlington & Quincy.

in tranit. However, the canvas bags are used when returning soiled linens to the commissary for laundering.

Breakage and Loss—The average railroad realizes the great loss due to excessive breakage. Present methods are wholly inadequate to combat this evil and new methods should be adopted.

Modern Commissary Kitchens—Commissary kitchens with modern equipment are a necessity for economy. Through the use of such equipment food can be processed, except for cooking, and ready for use when delivered to the dining cars. To facilitate this service, there are several items of equipment necessary, such as specially constructed sanitary sandwich tables, potato peelers, meat grinders, and germicidal lights for killing bacteria during the processing of food. Processing of food prior to delivery to the cars eliminates a great deal of bulky garbage that ordinarily accumulates.

Handling Cars of Company Materials

*By D. H. PHEBUS, Chairman**

Your committee strongly emphasizes the necessity for conservation and maximum use of our war-worn cars. Because of the tremendous demand for equipment, and since the stores departments on many of the larger roads handle between 45,000 and 50,000 carloads of company material annually, we consider this subject of vital importance and recommend that it be continued for another year to keep pace with the changing conditions.

At a meeting of the General Committee it was suggested that this committee consider the trucking of materials from stores to freight houses on local shipments, at the same time picking up incoming shipments, rather than using freight cars. Based upon a study made by this committee, it is not felt that we can definitely recommend this procedure as a general practice. While it may be the most satisfactory method for some roads, it would not necessarily be for others. Items which require expediting, of course, must at times be handled by special truck.

Recommendation

We therefore recommend that each road study its own conditions, taking into consideration trucking equipment available, facilities at both the general stores and the freight houses, availability of non-revenue cars for handling company materials, and any other factors which might affect their individual handling; then each road decide which method is best adapted under the conditions and needs which prevail.

We earnestly solicit the support of the membership in reviewing with us the following subdivisions of our subject, and we recommend that where practical, the suggestions be applied by the individual roads in the handling of company material cars.

* Asst. Gen. Storekeeper, Chicago, Milwaukee, St. Paul & Pacific.

Our study, made through the cooperation of member roads, indicates that many of these suggestions have been adopted, and have brought desired results.

Loading Cars to Capacity—Make sure that capacity loads are obtained, either as to bulk or as to weight, even though it may be necessary to reduce the number of schedule cars now loaded. Avoid light loads through freighthouses by use of automotive equipment. Shippers are urged to load to capacity, and the carriers should do likewise. Suitable and proper containers are necessary and material skids and pallets should be used when possible. Loading schedules should be checked periodically.

Control Carload Shipments from Dealers—Shipping dates on oils, engine sand and bulky materials should be arranged to permit sufficient storage space when the cars reach destination. Continued study is necessary to keep storage facilities in line with consumption. All material should be scheduled for delivery only when storage and facilities are available to release cars.

Avoid Ordering Cars for Loading Before Needed—When requesting empty cars for loading, a detailed list should be furnished the yardmaster or dispatcher, indicating the commodity to be loaded as well as the destination, and, if special, the date you expect to load the car should be given also. This will give them an opportunity to select the proper equipment.

Advance Shipping of Material to Jobs—Storekeepers should avoid shipping any material out on the line to a job in advance of date that the ordering department specifies it will be needed. The material may be assembled in advance and it is preferable that all material for one job be shipped at the same time. Close cooperation with the using department is necessary to accomplish this.

Prompt Placing of All Cars — To avoid delays at destination and unnecessary switching, yardmasters should be informed in advance when cars are expected.

Prompt Unloading of All Cars—Company material (other than locomotive coal) should be unloaded within 24 hr. after arrival. Consignee should contact the yardmaster or dispatcher upon receipt of the way bill or other advice to insure prompt spotting of cars.

Storage Facilities — Ample storage facilities should be provided to permit the unloading of cars with one spotting, this to avoid delay to tank cars and eliminate extra switching.

Proper Loading for Two or More Points—If material is being loaded for two or more points, it will be placed in reverse of the order it is to be removed, and the unloading facilities at destination must be known to the shipping storekeeper. Proper securing of the load will avoid delays while en route and facilitate unloading.

Use Cars Not in Seasonal Demand—On some roads coal moves in one direction while lumber moves in the opposite. This arrangement permits the handling of both commodities in open top cars. The movement of certain commodities is seasonal and if special equipment is provided, such equipment would be available for other commodities during the off-season.

Loading and Unloading Cars—Automotive equipment should be used where practical to speed up car loading and unloading. A continuous study of this subject is necessary to permit the full utilization of this equipment.

Car Reports—Car reports are necessary for the transportation department and a copy is also required at unloading point to permit prompt spotting, unloading and switching out released cars. Failure to handle these reports properly may cause serious delay in supplying empty cars for commercial loading.

Give Advance Notice — By giving yardmasters or dispatchers advance notice of car needs, they are able to better supply the proper class of car at the desired time, and close cooperation is necessary at all times to insure good operation.

Inspection of Cars for Loading—Cars, before being loaded, should be inspected by authorized car inspectors. This will avoid accidents with resultant delays while en route. After the car is spotted for loading they can often make light repairs, permitting the car to be moved.

Use of Motor Trucks in Congested Territories—Some roads have advanced this practice to such an extent that practically all material is delivered by trucks or automotive equipment in congested terminals. Most of the using departments are equipped with trucks for their own use, and with a concentration of material at strategic points, they have been able to eliminate almost entirely the use of material cars at terminals.

Exchange Materials

*By T. E. SAVAGE, Chairman**

The question of pricing any offerings shows a decided difference of opinion among the members of this committee, and it is evident that this is a reflection of opinions in the offices of individual railroads which have materials to dispose of. However, it is our opinion that this subject should be given close attention when preparing lists, instead of following the generally established custom of arbitrary percentages on new and used material. Perhaps some lists could be offered at more attractive prices to interested railroad purchasers.

It is recommended that care be exercised and every effort extended to give a full and complete description of material being offered. So that it can be easily identified, only material standard to all railroads should be advertised; and only one class of material should be included on each sheet. Attention is called to an item in a previous committee report to the effect that manufacturers, from whom inactive materials have been purchased, be contacted in an effort to dispose of such items directly to the manufacturer; or perhaps a hint could be obtained as to possible places where such materials might be sold.

* Purchasing Agent, Erie.

M. of W. and Construction Materials

*By W. R. H. MAU, Chairman**

We have outlined in this report some of the practices which require probably more constant attention and which have been found to produce results as indicated on several railroads.

Line Stock Supervision

Road A—Line stockkeepers are located in the office of the district storekeeper, one or two in each office, depending on the territory served. Their duties are to contact the users of material on the line, following through to see that the supervisor's, or division engineer's, requisitions are filled, and that the material is shipped and properly cared for and reported when applied.

Frequent trips over the line are made by these stockkeepers, accompanied by supervisors; during which time, in addition to other duties, they arrange for the movement of any released material or scrap to the district store or other point of use. These men also make spot checks, or trial inventories, from time to time, through which they determine any items have been used or applied where the foreman has neglected, or overlooked, properly reporting their use in material or charge books.

The time not spent on the line by these men is consumed in the district storekeeper's office, principally around the first of the month, when they check the material books in which the foreman charges all material as used to line record of material, crediting the line stock with any disbursements.

Material Requirements

Road B—District material supervisors, working under the direction of assistant general storekeepers in charge of various territories, are held responsible for forecasting material requirements, as well as procurement, distribution, storage and control of all on-line materials, including all materials and scrap released by on-line forces. Following are some of the methods used to handle this important work in a satisfactory manner:

Material supervisors are on the line continually in order to be in touch with material conditions and to assist using departments in obtaining their material requirements; also seeing that requisitions are prepared and forwarded to stores department covering correct quantities of materials required for scheduled program work, and materials and supplies required for ordinary operating and maintenance. When conditions require, arrangements are made by telephone or telegram for emergency shipment from general stores to avoid unnecessary delays to jobs.

As supply trains travel over the various divisions, supervisors check material on the ground and make delivery of necessary items to meet requirements; also in the event any items required have not been ordered due to change in plans, increased work, or because gangs have been increased since requisitions were placed; such items are delivered from supply trains on verbal approval of division superintendent or division engineer.

Stocks Held to Minimum

At all points where a storekeeper is located, the entire stock of track material, including rail, is under his jurisdiction, with the exception of a small supply of track bolts, spikes, tie plugs, frog bolts, etc. The latter items are used frequently in daily maintenance work and are carried in section tool houses. This supply is replenished weekly from the local storekeeper's stock, and all other materials, such as frogs, switchpoints, switch material, angle bars, tie plates, etc., are obtained from the storekeeper as required.

Where section tool houses are located in yards where there are no storekeepers, the entire stock of track material is carried in one location most convenient to section forces. This supply is definitely set as to items and quantities and includes (in addition to required number of angle bars) tie plates, track spikes, track bolts, frog bolts, and the necessary switchpoints to protect the turnouts in yard at such locations.

At intermediate section tool houses, track maintenance materials are confined to track spikes, track bolts, tie plates, angle bars, rail rack rail; but no frogs, switchpoints, switch parts, anti-creepers, compromise joints, and abrasion plates. The quantity of track repair material carried is set by the roadmaster's district, with instructions that this quantity is not to be exceeded without authority from the engineer maintenance of way. Distribution of set quantity to section tool houses on each roadmaster's district is left to his discretion.

Distribution of maintenance materials and supplies is made by regular scheduled supply trains operating from general stores, under supervision of district material supervisors. In heavy traffic, supply train crews cannot take time at stations and terminals properly to inspect tool houses, stations, freight depots, pumping plants, and other buildings and facilities. To insure proper supervision by the stores department, with definite responsibility of seeing that material at all locations on the property is checked currently and to forecast requirements, periodic trips are made on motor cars over the divisions by district material supervisors with division engineers, roadmasters, signal, bridge and building supervisors and supervisors of other departments in their regular tour of duty. This is done in supply train territory in advance of supply train arrival so that all materials, tools, and scrap not actually required will be concentrated and listed to be picked up to avoid unnecessary delay; and only actual requirements of materials and tools are delivered by the supply train.

District material supervisors direct movements of materials from general stores and coordinate deliveries of materials—when, for example, both track and signal materials are involved. On rail relaying programs, requisitions are checked to insure that only such quantities required to meet immediate program work are furnished. Delivery dates on purchase orders are placed to coincide with shipments of rail, so whenever possible carload shipments of angle bars, track spikes, switches, etc., can be diverted from manufacturer to specific rail jobs; thus avoiding special handling by stores department and backhaul. This is accomplished on receipt of advice from the steel mills as to movement of rail; which information is promptly furnished to the district material supervisor so he in turn can arrange for shipment of all fittings required, in order that rail and fastenings will arrive on the job at the same time, closely co-ordinated with progress of the work.

Surplus Materials and Scrap

When rail relaying jobs are completed, district material supervisors follow up to see that all material, including rail removed from track, is shipped promptly to nearest general store, where it is checked by a qualified inspector and made available for second-hand rail programs or industry jobs. This supervision also prevents diversion of released rail and fittings to other points on the same division, which sometimes has been the cause of accumulating excess on-line stocks.

In traveling over the line, these employees watch stock of track material, as well as other materials and supplies in tool houses, pump houses, etc., to see that stock is held to a minimum and that it is maintained according to standard practices by keeping material wherever it may be in proper place and in a neat and orderly manner.

Signal Materials

The extension of signal control and C.T.C. controlled territory involves increased signal material stocks, and such stocks should be under the jurisdiction of the stores department; also proper stock records should be maintained to determine what replacement items and amounts should be carried in stock.

Repair and Material Stocks

The increased use of roadway machinery, such as wood cutters and burners, graders, bull-dozers, pile drivers, ballast cleaners, tampers, etc., presents the possibility of creating stocks of repair parts which are excessive and easily subject to obsolescence, or at least very slow moving. To correct this, the stores department should maintain careful stock records of needs as they arise, building up a maintenance and repair stock based on actual needs of wearing parts, as determined by stockbook records and experience, rather than a manufacturer's lists of essential parts.

Distribution of Oils

The importance of constant supervision, particularly in the distribution of gasoline and kerosene to the line of road was a matter of study by your committee, and

* Purchasing Agent, International-Great Northern.

our discussions revealed that many divergent practices are in effect in conjunction with the purchase and distribution of these commodities, some of which are of course, attributable to local conditions. Many railroads purchase these fuels in tank car lots and distribute them by drums; others purchase locally or by tank wagon.

Material Stock Inventory-Pricing

*By B. T. ADAMS, Chairman**

The committee decided that the material stock report in its present form is satisfactory and should be continued as a semi-annual report, as it is of value to the railroads as a basis of comparison on material and supplies, and that no changes are necessary. It is suggested that the members of this division follow up at the end of each period and have the information from their respective roads furnished promptly to the executive vice-chairman.

The last consolidated report shows the following information:

Annual inventories are compiled on the railroads in accordance with instructions from the chief accounting officer, but the work involved is performed largely by the stores department; and we are, of course, interested in having it performed in the most efficient manner. We should, therefore, be able to suggest to our accounting department the best method of listing the quantities on hand at inventory periods, so as to reduce the work involved.

Information furnished the committee indicated the following methods generally used by the railroads for listing material and supplies on hand for inventory.

(1) Writing separate inventory sheets for items by material classifications. These sheets are usually typed or printed on addressograph machines prior to the inventory period, and are ready for distribution to storehouse forces on date of inventory. The material, when counted, is listed on the sheets, and where direct pricing is used the price is inserted at the same time, quantity on hand of each item is listed, completing both operations—listing and pricing—simultaneously.

For stocks on line of road for use by forces engaged in maintenance of way and structures work, the material is listed in field books as the inventory party travels over the road; and, at the completion of the trip, the material on each district is summarized and the totals entered on inventory sheets.

(2) Inventory cards are used for listing the material on hand in storehouse and storehouse yards, and are printed in the same manner that stockbook sheets or cards are prepared. The cards have columns for several years' use, and on one road the same card is used for 10 years. For material on line of road, distributed for maintenance of way and structures work, field books are used and a summary made at the end of each territory, the totals being listed on the inventory cards.

(3) The inventory count is listed on regular stockbook sheets, or cards used for controlling stock, in spaces printed on these sheets for the inventory each year, showing the quantity, price and extension for each item. This method uses the basic stock record for material and supplies for inventory purposes and the inventory is perpetuated in these books at the storehouses for the period as required by the I.C.C. Stockbooks or cards are generally used for periods of from 6 to 8 years.

On roads using this system, the values as reflected by each stockbook are reported to the accounting department for inventory, and the stockbooks are kept at the storehouse for daily use in maintaining and controlling stock.

On these roads, material in line stock is listed in field books by the inventory parties as they go over the road and summaries are made at the end of each district, and total for each item entered on stockbook sheets maintained for line stock purposes.

Recommendations

Your committee gave serious consideration to the three principal methods employed for listing material and supplies for the annual inventory, and arrived at the conclusion that the use of stockbook sheets or cards accomplished the purpose with minimum additional work.

The use of the basic stock record—the stockbook—for the inventory eliminates all typing or printing of special inventory sheets or cards and the extra handling of them. It also provides a ready comparison of the inventory count with stock record count for the item throughout the year. We suggest the members of the division give the preparation of their annual inventories on the stockbook sheets or cards serious consideration, with the view of securing the approval of their accounting department for adoption.

Pricing Methods and Practices—The committee did not find any need for change in the adopted practice of the division on pricing methods or practices, and there is no necessity to elaborate on such practices, which have been fully covered by the reports of previous committees.

Machine Accounting—Our study did not indicate that actual machine accounting was being performed in its entirety, but that such work, when performed entirely by machine, was being done by the accounting department where greater use of the equipment could be utilized, such as in the preparation of payrolls, data for retirement records of employees, interline freight and passenger accounting, and other work where machine accounting is practical. Therefore, we do not have any recommendations for the use of such machines in the purchase and stores department.

* * *

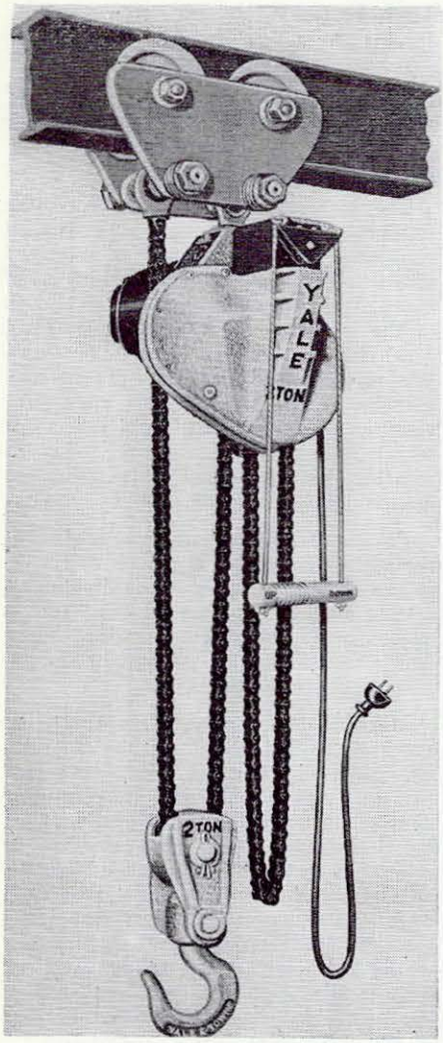
Consolidated Stock Report

Period	Total Roads Reporting	Total Average Miles Operated	Total Average Monthly Disbursements	Total Value Unapplied Material	Total Average Days Supply
June 30, 1945	118	223,572	$147,798,238	$577,207,191	117
June 30, 1944†	98	212,425	141,260,049	543,242,055	114

† Class I railroads only.

One of the new Electro-Motive Diesel-electric locomotives placed in operation by the Atlantic & East Carolina, said to be the first American short line railroad to use mainline Diesel locomotives. Three Diesels will replace seven steam locomotives of ancient vintage

* District storekeeper, Illinois Central System.



Two-ton trolley type Midget King electric hoist

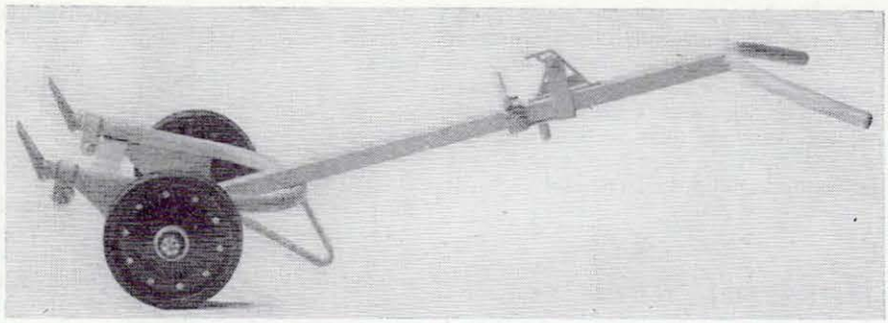
Midget King Electric Hoist

The Yale & Towne Manufacturing Company, 4530 Tacony Street, Philadelphia 24, Pa., has added a 2-ton model to its Midget King line of electric hoists. This new model is comparatively light in weight, yet provides fast lifting power. It is equipped with a 1-hp. motor and lifting and lowering action is obtained by a flip of the wrist on the one-hand bar-grip control.

The load hook is made of special steel to provide maximum safety for both load and worker.

Safety upper and lower limit stops prevent over travel of the hook, and the load brake and the independently acting motor brake operate whether the power is on or off; both brakes and all wiring and controllers are completely enclosed.

The 2-ton Midget King electric hoist is available with hook for stationary use and with a permanently attached trolley for use on an overhead track.



Colson light-weight drum handling truck for shops and storehouses

Colson Drum Handling Truck

An all-steel truck designed to handle drums and barrels from 23 in. to 48 in. high and as small as 18 in. diameter has been developed by the Colson Corporation, Elyria, Ohio. The main frame consists of two rectangular steel tubes which are lightweight and yet strong enough to sustain heavy loads. The wheels are 10 in. diameter with annular ball bearing hubs mounted on a 1 in. steel axle. Rubber-tired wheels are double steel disc type with demountable cushion rubber tires.

The climb hook locks semi-automatically and will retain its hold on practically all types of steel, wood, or paper barrels and drums. The position of the tips, tip roller wheels and hand grips are such that the pull in rocking the loaded truck over on the wheels is equalized and the average load is evenly balanced on the wheels for easy handling.

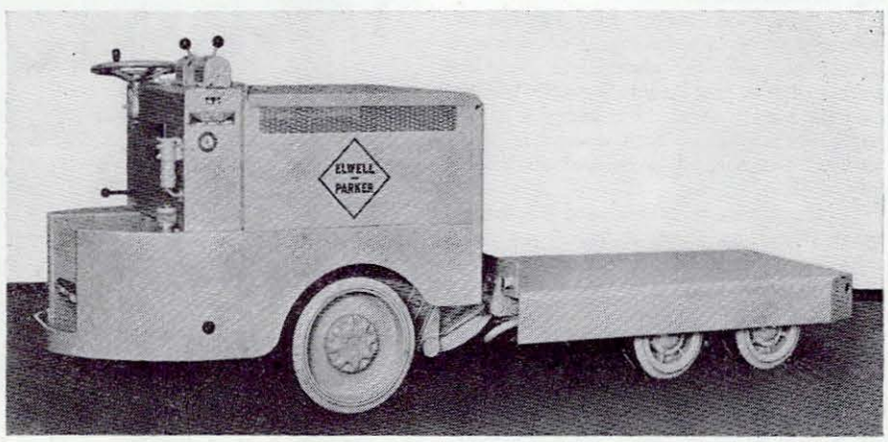
Ten-Ton Industrial Truck

A ten-ton industrial truck developed by the Elwell-Parker Electric Company, Cleveland, Ohio, for use during World War II is now available for railway services. Powered by storage batteries and electric motors, it is claimed that it can attain a speed of 6 m. p. h. Having an overall width of 45 in., it may be turned in narrow aisles and maneuvered in and out of box cars for loading and unloading. Steering is accomplished by means of all six wheels, four of which are under the load bearing platform to insure load stability.

Compactly designed and with adequate safety features, these electrically driven and controlled trucks provide smooth, quiet and flexible operation. The body of the truck is low and the operator has complete visibility of platform, load and surroundings.

Car Wheel Handling Device

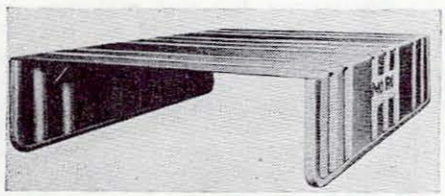
An attachment for handling car wheels has been announced recently by the Baker Industrial Truck Division of the Baker-Raulang Company, Cleveland 13, Ohio. This improvement consists of a steel hoe-like hinged arm with a lever for raising the arm. The arm and lever assembly is mounted on a bracket which slips on top of the fork backs and is held in position by its own weight. This de-



Six-wheel construction assures stability, and electric drive and controls provide flexibility

vice is designed to fit a standard Baker fork truck and may be removed when the truck is used in handling pallet or other type loading.

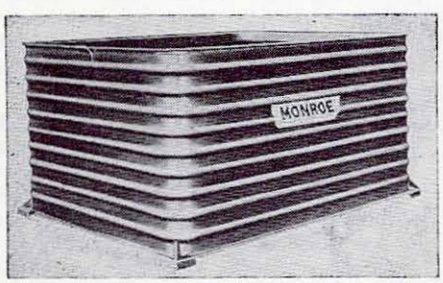
To pick up a load of wheels, the arm is raised by pulling back and latching the lever. Lift forks are then run under the wheels that are to be lifted—if wheels do not tilt alike, they may be straightened by forcing one wheel against the other with the truck, the bottom edge of the attachment bracket being turned over in a lip which presses against the wheels. The handle is then unlatched and the arm lowered. The forks can be raised, picking up the wheels in the same tilted position in which they are stored.



High-tensile steel platform skid

Monroe Material Handling Equipment

Weight reductions ranging as high as 40 per cent with correspondingly greater payloads, and substantial economies in both cost and shipping, are claimed for a new line of material handling equipment announced recently by the Monroe Auto Equipment Company, Monroe, Mich. Manufactured of high-tensile steel, the line consists of six products which are available in various standardized sizes to include a total of fourteen units of platforms, nestling rings, boxes, skids and pallets.



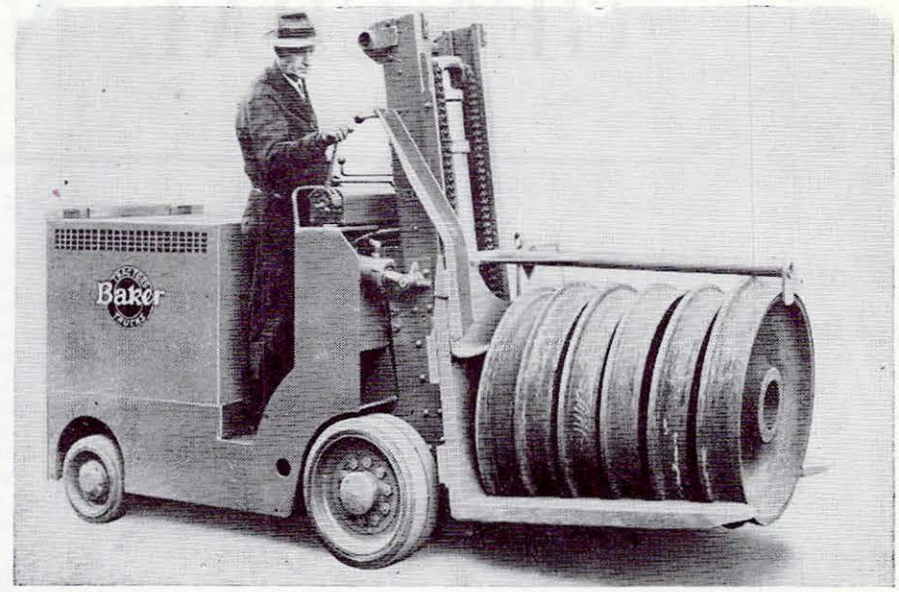
Monroe steel nestling ring for use on platform skids to convert to boxes

The weight reduction is accomplished by using high-tensile steel instead of the usual hot-rolled low carbon steel. In the new line, for example a 42 in. by 60 in. by 12 in. basic platform skid without runners weighs 155 lb. in 11-gage high-tensile steel instead of 234 lb. in 7-gage hot-rolled steel. In another instance a 48 in. by 48 in. all-steel pallet weighs 83 lb. in the new 18-gage high-tensile steel compared to 129 lb. in 14-gage hot-rolled steel.

This weight-saving is said to permit more payloads in factory use, and effects economies in shipping weights. In addition, standardization of the various units was accomplished with a view to proper sizes for maximum shipments in trucks, trailers and railroad freight cars.

In all cases, the redesigning and use of high-tensile steel provides strength of construction that is equal or greater than that of the heavier hot rolled steel.

Such features as corrugated knee braces give additional strength when required.



Device for handling car wheels is used for both 33 in. and 36 in. wheels

Articulated Fork Truck

The Baker Industrial Truck Division of the Baker-Raulang Company, Cleveland 13, Ohio, has introduced a 4,000 lb. capacity truck known as type AIMH Articulated Fork Truck which is designed primarily for shop and storehouse operation. It permits the operator to increase the available storage space by cutting aisle requirements. The design involves a new method of steering by "articulating" the frame; this permits swinging the load to line it up in position without lining up the truck itself. It is claimed that this truck requires approximately 3 ft. less aisle space for placing loads at right angles to aisles and less clearance than conventional types.

Articulated steering permits turning in a smaller radius

GENERAL NEWS

Pullmans Are Newer Than RR-Owned Cars

Crawford, commenting on C. & O. ad, says average 5 years less than rr. mean

Stockholders of Pullman, Inc., in a circular letter dated August 15, are reminded by President D. A. Crawford that several "competing financial groups," as well as the "general railroad buying group," had been "active bidders" for the sleeping car fleet of the Pullman Company and the Pullman operating organization. Such rivalry to buy the Pullman sleeping car business, in Mr. Crawford's opinion, "rather strongly controverts the depreciatory assertions," regarding Pullman's degree of modernization, made in recent advertising by the Chesapeake & Ohio (*Railway Age,* August 3, adv. page 62).

Quotes Railway Age—Mr. Crawford's letter also reproduces the editorial "Modernity of Sleeping Cars" from the August 3 *Railway Age,* page 160, which is characterized as an expression "from an authoritative source of opinion in the railroad industry."

"Statistical records show clearly," Mr. Crawford's letter goes on to say, "that under Pullman ownership and management the fleet of standard-class sleeping cars averaged some five years less in age than the passenger car fleet of the railroads as a whole in 1945, and contained a much higher percentage of modern lightweight units. The possibility of furnishing sleeping car service at all on lightly-loaded unprofitable side lines, of offering a bargain price tourist-class sleeping car service in the West, and of maintaining the standby reserve of cars for troop service that became so important in wartime, all depends upon keeping available the older but physically sound open-section units withdrawn from the more important lines of standard-class sleeping car service, on which the mass of Pullman sleeping car service to the traveling public is performed. Finding appropriate uses for these older but physically sound car structures is a real economy and a public benefit, but their presence in the Pullman fleet does not afford any real picture of the sleeping car service that is actually furnished on the important lines of travel.

850 Sleepers on Order — "It is a pertinent fact that through the pre-war decade Pullman stood ready to furnish, and did furnish, about $47,000,000 worth of modern lightweight sleeping car equipment to the progressive railroads that were willing to participate in the necessary contractual commitments. This block of modern lightweight sleeping cars was used in equipping the sleeper streamliners that were such an important element in the improvement of railway passenger service prior to the war. Such progressive railroads have in recent months placed orders for approximately 850 additional new sleeping cars, and as was the case before the war, it has been these railroads and the Pullman group of companies that have taken the lead in this continuing process of improvement and modernization of the sleeping car service.

"Pullman needs no prompting in this responsibility. The stockholders of the Pullman group of companies have every reason to be proud of the performance of their operating and manufacturing organizations, in this cooperative movement for the modernization of all kinds of rail passenger equipment and in the resultant improvements in the sleeping car service of the Country, despite Governmental and wartime interferences."

Car Shortage Acute in Canada

The recent epidemic of strikes and the deferment of equipment renewal and repair during the war have contributed to the development of a shortage of box cars on Canadian railroads approaching "famine" proportions, Ottawa authorities recently were quoted as saying. All available Class A box cars are required in the West for the movement of what promises to be a record-breaking grain crop, leaving only second-class cars for the industries of eastern Canada, now resuming full production following interruptions caused by labor troubles and material shortages. The possibility that the Canadian car shortage might run as high as 15,000 cars was conceded, the situation being described as one of the worst ever experienced, and it was pointed out that many of the cars the railways are obliged to keep in service are ready for scrapping.

Ringberg Becomes Mechanical Engineer, Transportation Corps

Emil G. Ringberg has resigned as mechanical engineer of the Boston & Maine and Maine Central to accept appointment as mechanical engineer, Army Service Forces, Transportation Corps, Rail Section, of the United States Army. His headquarters are at the New York Port of Embarkation, Brooklyn, N. Y. Mr. Ringberg left the position of superintendent of shops of the Boston & Maine in 1943 to become commanding officer of the 764th Military Railway Shop Battalion, E. T. O., with the rank of Lieutenant Colonel. He returned to railway service in March, 1946, and assumed his new position on August 1. During World War I Mr. Ringberg saw service with the 14th Engineers (light railways), A. E. F., France.

Saturday Unloading of Coal Cars Asked

Request to dealers, shippers and consumers made by Colonel Johnson

Pointing out that coal production and weekly carloadings of coal are currently reaching record and near record totals, Colonel J. Monroe Johnson, director of the Office of Defense Transportation, last week urged retail and wholesale coal dealers, coal transshippers and utility, transportation and other industrial coal users to make immediate provisions for the unloading of coal cars on Saturdays and the unloading of all coal cars within the allotted free time.

Colonel Johnson said that coal cars must be unloaded and returned to the mines as quickly as possible in order to assure a maximum of production before winter weather slows down operations. He added that as a result of the stoppage of mining activity for almost two months this spring the railroads are being called upon to transport this year's coal supply in a ten-month period. He said that since bituminous production was resumed early in June, average weekly production has been running almost 500,000 tons over last year. He reported that production for the eight-week period ending July 27 totaled 3,500,000 tons over the comparable 1945 period.

According to the O. D. T., the resulting increase in coal car demand is "coming at the same time as the steady increase in demand for other types of rail freight transportation, putting a greater load on motive power and other rail facilities." It added that coal cars also are in a heavy demand to move shipments of sand, gravel, stone and other building and road building materials.

Production Endangered — Colonel Johnson noted further that the present traffic conditions and the five-day unloading schedule of coal are "not only creating serious car shortages, but the car shortages in turn are resulting in the curtailment of production in some coal fields." He said that "the effect is inevitable" with the miners working a six-day week, adding that the cars must be returned to the mines "because there are no means for storing coal between the time it is mined and shipped."

Declaring that "the 21,000 coal car shortage" reported for the week ended July 27 represents a potential production loss of approximately 1,150,000 tons of coal, Col. Johnson said that "in addition to the heavy demand for coal cars for industrial and

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German Rail System Improvements Noted

Passenger and freight service increased during May, War Department report says

The inauguration of two new long-distance passenger trains and the resumption of double-track freight operations through Munich and the Bremen corridor highlighted the improvement of rail transportation facilities in the United States Zone of Occupation in Germany during May, according to the War Department's latest report on industrial conditions in that country.

The report showed that passenger traffic remained "strong" in May despite a general increase in fares on April 1. It noted that although the use of buses and other vehicles eased the pressure on local trains, long-distance passenger trains constantly were overcrowded, resulting in many persons being left behind, a situation partially attributed to the eased traveling permit procedure. Although the "higher average temperatures in April" resulted in increased passenger train kilometers, passenger locomotive kilometers and coal consumption in that month as compared to March, the report also disclosed a 13.7 per cent reduction in the number of tickets sold and a decline of 20.6 per cent in the number of trips.

Sixty Per Cent of B. O. Equipment—"On an average," the report continued, "there were 8 per cent more usable cars available in May than in April, but less than 40 per cent of locomotives and passenger cars are yet in serviceable conditions, and nearly half of the freight cars being used belong to foreign countries. Meanwhile traffic continues to be hampered by shortages of rolling stock, particularly locomotives, and repairs are hard to schedule because of lack of parts. Lack of employees for particular jobs or at particular points often causes operating difficulties. In spite of such difficulties, coal movement from the Ruhr and Cologne reached a daily peak for the year of 41 trains on May 11, including 10 regular trains to Austria and two each day from Poland to France."

"On the whole, there were no significant embargoes still in effect in May on carload traffic, except on civilian freight to the Soviet Zone," the report revealed. "The barge-to-rail traffic at the inland ports of the Rhine, Main and Neckar rivers increased 4 per cent over the preceding month. Transshipping has not yet been resumed at Danube ports. Rail-to-barge traffic remained insignificant. Eighty-one per cent of transshipped freight was coal; car supply for this purpose was satisfactory.

Decreases in net tons per loaded car and in the percentage of cars loaded to total car-miles, a situation attributed in part to the extensive returns of unserviceable freight cars to foreign owners, also was reported for April, during which month 3,500 freight cars were sent back to their home countries as compared with 1,500 in March. The average repair turnout per working day amounted to 16.3 locomotives in May as compared with 16.8 during April. The repair of freight cars during May was given preference over that of passenger cars, although a shortage of materials and spare parts continued to affect repair work at all shops.

In an accompanying report on the rail transportation situation in Japan, it was noted that the cancellation of scheduled train operations was reduced from 190,635 kilometers to 187,688 kilometers in April. Working kilometers of the government railways increased from 19,528 to 19,534 kilometers, and the number of stations in operation increased from 4,109 to 4,117.

I. C. C. Bureau to Assist O. D. T. in Enforcement of Orders

The Office of Defense Transportation announces that it has completed "arrangements" with the Interstate Commerce Commission whereby service agents of the commission's Bureau of Service will undertake the work of isolating and reporting non-compliance with O. D. T. orders and regulations affecting railroad transportation.

According to the O. D. T., the work performed for it by the service agents will be in addition to their present duties which require them to report on railroad and industrial practices which result in delays to railroad equipment. The agents will continue to work under V. C. Clinger, director of the Bureau of Service.

The O. D. T. said that the bureau's field force has been increased from 50 to 71 and that 49 service bureau offices are now in operation. The offices are located in 17 districts distributed geographically according to rail traffic density. The agency reported that work performed for it will be paid for on a reimbursable basis.

The O. D. T. also noted that all of its field offices, with the exception of one at Chicago, Ill., were closed during the past year.

Ralph Budd Honored At A. S. M. E. Dinner

The Railroad Division of the American Society of Mechanical Engineers held a dinner at the Congress hotel, Chicago, on August 7. Two features of the dinner included an address on "The Challenge of the Future" by Samuel O. Dunn, editor of *Railway Age*, an abstract of which address was published in last week's issue, and the presentation of honorary membership in the society to Ralph Budd, president of the Chicago, Burlington & Quincy. K. F. Nystrom, chief mechanical officer of the C. M. St. P. & P. and chairman of the A. S. M. E. Railroad Division, presided at the dinner and, after Mr. Dunn's address, introduced T. W. McEwan, vice-president and director of the society at Chicago, who made the formal presentation to Mr. Budd. The citation which accompanied the award of honorary membership read as follows: "To Ralph Budd, president, Chicago, Burlington & Quincy Railroad Company: Forty years a railroader, a pioneer in the development of Diesel-powered light-weight trains, civil engineer and executive, builder of railroad organizations, a great railroad man."

Wheeler-Reed Bill Vetoed by Truman

President objects to railroad reorganization provisions as not strong enough

Revealing his objections in a "memorandum of disapproval" President Truman on August 13 "withheld approval" from the so-called Wheeler-Reed bill, S. 1253, to establish means short of bankruptcy proceedings for the adjustment of railroad capitalization, and to allow the owners of certain roads undergoing reorganization to effect such readjustments by agreement rather than awaiting completion of proceedings under section 77 of the Bankruptcy Act. The legislation, passed in the closing hours of the Congress which adjourned August 2, thus fails to become law.

The President's decision not to sign the bill, reportedly reached after the comments of interested executive agencies of the government had been considered, was not intended to indicate that he approves pending reorganization plans, according to the White House memorandum. "I am in agreement with those objectives of the bill which prevent undesirable control of the railroads, either immediately or within a few years, and which prevent forfeitures of securities," Mr. Truman explained, and "I am familiar with the deficiencies and inequities and the evils that exist under section 77," but "I fear that this new bill would not accomplish the purpose for which it was intended."

The memorandum stated the President's objections as follows:

Wants Bankrupts' Interest Cut—"The bill fails to direct specifically the immediate reduction of the grossly excessive interest rates now wasting the funds of the railroads in section 77 proceedings. Millions of dollars per year can be saved at once for each of the railroads in section 77 proceedings by reducing the interest rates on their bonds and other debt down to the level of the interest rates paid by railroads not in section 77 proceedings. . . .

"The bill does not adequately cure the evil, present in reorganizations under section 77, of permitting improper control of railroads after their reorganization.

"The bill fails to provide full protection against forfeiture of securities and investments.

"The level of fees and expenses in reorganization cases under section 77 has been excessive. This is not corrected in this bill. Affirmative provisions to curb this evil and to bring it under strict control should be included in any bill which may be enacted.

"The bill excludes from its benefits certain railroads which should be brought within its provisions if it is to become law. In this regard it appears that the fifty million dollar limitation in section 2 of the bill would exclude some railroads for whose exclusion there appears to be no logical justification.

"This bill fails to correct a serious abuse which I condemned in the course of the

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Better Last Half, I. C. C. Bureau Says

"Monthly Comment" suggests first six months' return was under usual ratio

The Bureau of Transport Economics and Statistics of the Interstate Commerce Commission predicts, in the latest issue of its "Monthly Comment," that "it seems not unlikely" that railroad revenue and expense figures for the first half of 1946 will be "appreciably less than one-half of the totals for the full year," because of "unusual conditions" prevailing in the first half.

This observation is accompanied by a tabulation, based on averages for five-year periods from 1926 through 1945, showing the percentage relationships of three, six and nine months' figures for operating revenues and operating expenses to the corresponding annual totals, these relationships being of interest, it was explained, because forecasts of results for the year frequently are based on such quarterly data.

Twenty Year Averages—In the case of total operating revenues the figures for the first six months of the year are less than half of the annual totals in each of the five-year periods considered. The percentages ranged from 46.8 for 1936-1940 to 49.19 for 1931-1935, the average for the 20 years being 48.10. A similar situation holds for freight, passenger and "other" revenues taken separately, the tabulation shows, with the percentages varying somewhat by periods. The low point in freight revenue was 46.64 per cent for the first half-years of the 1936-1940 period, in passenger revenue it was 45.92 for 1941-1945, and in other revenue 47.46 for 1936-1940. Based on the 20-year period, freight revenue in the first half of the years averaged 48.16 per cent of the annual totals, passenger revenue 47.70 and other revenues 48.23 per cent.

Operating expenses in the first half of the years 1931-1935 averaged 51.41 per cent of the annual totals, while in the other five-year periods the percentages were: 1926-1930, 49.82; 1936-1940, 48.78; and 1941-1945, 46.74. The drop in the latter period was due primarily, according to the bureau, to "extraordinary charges to operating expenses for amortization of defense projects in the latter months of 1945." For the 20-year period, the average percentage of operating expenses incurred in the first half of the year was 48.63, compared with 48.10 for operating revenues earned.

Turning to a review of freight and passenger service operating ratios of Class I railroads, the "Comment" points out that in 1945, for the first time in any year since 1920, the passenger service operating ratio (76.83) was slower than the ratio for freight service (79.98). This was partially a result of the accelerated amortization of defense projects in the latter half of 1945, it explains, however, and it is calculated that the passenger and freight ratios for 1945 would have been 73.10 and 68.90, respectively, if all amortization charges had been deducted from operating expenses. Over the 10-year period beginning with 1936 the most favorable operating ratio for freight service was 61.05 in 1941 and for passenger service 64.77 in 1943.

Another tabulation shows the changes in the trend of freight service and passenger service net railway operating income of Class I roads, in the past 10 years. This indicates, of course, that earnings from freight service had to absorb large passenger deficits from 1936 through 1941, while passenger service made a substantial contribution to net in the latter four years of the period. "What the trend will be in the next few years is of course problematical," the bureau observes, adding that "no doubt the railways will make strenuous efforts to compete for passenger business by improving equipment and service, with greater emphasis on comfort and speed, and perhaps by reducing fares."

Debt Declined—There was a decline of $494,577,000, or 6.24 per cent, in the amount of unmatured debt of Class I line-haul roads outstanding at the end of 1945, as compared with the end of 1944, the bureau reports. Total long-term debt was 5.54 per cent less than at the end of 1944 and 11.25 per cent less than at the end of 1943. Debt in default at the close of 1945 was 20.19 per cent less than at the close of 1943.

In another section of the "Comment" the bureau remarks that data so far available indicate a "decided decline" in the number of fatal and non-fatal injuries to employees in railway accidents of all kinds in the first half of this year in comparison with the same period of 1945, the percentages of decrease being, respectively, 27.1 and 20.4. The average number of employee fatalities for the period 1940-1944 was 46 per cent above that for the preceding five-year period, while the increase in non-fatal injuries was 81 per cent. These "striking increases are presumably attributable largely to war-time traffic conditions," the bureau observes, and it points out that "the exposure factor represented by total man-hours of work performed increased 33 per cent" at the same time.

"Other Compensation" Up—Payments of "other compensation" to Class I railroad employees, in addition to payments for straight time and overtime, have increased "considerably" since 1940, the bureau reports. In the case of non-operating employees "other compensation" represents payments for time not actually worked, such as holidays, absence on leave, and vacations. For train and engine service employees it covers payments for "constructive" time allowed not representing actual train service, such as pay for time held away from home terminal, called-out and not used, run-around, deadheading, attending court or investigations, and so on, and since 1944 vacations also.

In 1940 payments for "other compensation" were 1.99 per cent of total compensation, while in 1945 the percentage had risen to 4.15. In the first four months of 1945 the percentage was 3.09, while in the same 1946 period it was 3.51 per cent. The large increases since 1941, the bureau comments, "are primarily the result of vacation with pay agreements included in the settlements

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A. A. R. Received O. K. From F. D. Roosevelt

So Pelley informs master in suit of Georgia against the railroads

The eastern railroads' disapproval of reductions sought in freight rates on certain commodities moving from the south to the east was based on sound economic reason, James P. Dervin, freight traffic manager of the New York Central, said on August 7 testifying before a special master at New York in Georgia's Supreme Court suit against the southern and eastern railroads. Mr. Dervin added that the action taken by the eastern railroads in this instance was not intended to discriminate against the south and did not have such an effect. In most of the cases where Georgia has charged discrimination on the part of eastern railroads, Mr. Dervin stated, the carriers "were convinced that the rates proposed were lower than necessary to move the traffic."

On August 8, E. A. Hodkinson, a member of the auxiliary committee of the Trunk Line Association, said that the smaller railroads exercised the right of independent thought and action in respect to rate matters the same as larger railroads. To support his statement, Mr. Hodkinson cited a number of instances where such railroads in Trunk Line territory as the Delaware, Lackawanna & Western, the Norfolk & Western, the Richmond, Fredericksburg & Potomac, the Lehigh Valley and the New York, Ontario & Western established rates on independent notice.

Rudolph G. Raasch, chairman and tariff publishing agent of the Illinois Freight Association, testified on the same day that he had never heard of a single case where one railroad diverted traffic from another railroad because of any rate action the latter may have taken. Pointing out that between 80 per cent and 85 per cent of all rate proposals docketed for consideration by Illinois Freight Association committees are for reductions in rates or involve no change in rates, Mr. Raasch reported that in 1940, a typical year, 83 per cent of all proposals submitted to the Association were approved.

During the past 25 years, the percentage of the nation's freight originating in the south has increased, while that in the east has declined, Dr. Julius H. Parmelee, director of the bureau of railway economics of the Association of American Railroads, said on August 14. Dr. Parmelee said this fact alone indicates the tremendous industrial and agricultural growth of the south in recent years. In 1921, Dr. Parmelee testified, 12.8 per cent of all railroad freight in the United States originated in the southern region, while in 1945, the percentage had increased to 14.3 per cent. In 1921, he reported, the eastern district originated 53.9 per cent of all revenue tons of freight, while in 1945 the percentage had declined to 49.6. The southern region, Dr. Parmelee pointed out, includes Georgia, Alabama, Florida, Ken-

tucky, Mississippi, North Carolina, South Carolina and Tennessee.

The Association of American Railroads was formed in 1934 with the approval of and after consultation with President Franklin D. Roosevelt and Joseph B. Eastman, then Federal Coordinator of Transportation, John J. Pelley, president of the Association, disclosed during his testimony before Special Master Lloyd K. Garrison, on August 14.

After pointing out that the railroad industry was in dire financial straits just before the formation of the A. A. R. and that it was felt the railroads should set up an organization to reduce competitive wastes and deal with matters of common concern in the whole field of railroading, Mr. Pelley said he visited President Roosevelt at Hyde Park on the day after Labor Day, 1934, "to discuss in detail with him both the critical railroad situation and the plan then being proposed for the formation of the Association of American Railroads.

"I went over the principal features of the proposed plan of organization in a conversation of more than an hour," Mr. Pelley continued. "After the President had thoroughly familiarized himself with it, he told me that he would endorse it publicly, which he afterward did, and would support the work of the association to be performed under the plan proposed, which he also did."

Mr. Pelley stated that he had similar discussions on the original plan before it was adopted, with Federal Coordinator Eastman, who advised Mr. Pelley, "he would endorse the new association publicly, which he did and would support its work." "We never had a firmer or finer support," Mr. Pelley added.

According to Mr. Pelley, the A. A. R., with 202 railroads as full members and 173 others as associate members, is an agency for "carrying on the great variety of work necessary to running the railroads which can be done better by a central organization than by each railroad itself. The great bulk of its work is in the field of its operation and maintenance dealing with questions of transportation, maintenance of way, and maintenance of equipment, which are common to the operation of the railroads. The association also deals with matters of accounting, taxation and valuation, of law and legislation, of traffic, of transportation economics, and of relations with the public in so far as such matters are common to its member roads."

Mr. Pelley called attention ot the fact that the association is the "lineal descendant" of numerous early organizations created for the purpose of carrying on research for the improvement of railroading and standardizing various features of railroad service, some of these organizations dating back as early as 1867. It is through the work of these organizations now merged with the A. A. R., he said, that the United States enjoys such things as standard time and standard parts of freight cars and other standard features which, by making it possible for the cars of any railroad to run over the lines of every other railroad, are responsible for the continent-wide character of American commerce. In describing the activities of the various departments, divisions and sections of the A. A. R., Mr. Pelley said the Association has no authority to make railroad rates and has no connection with the various railroad territorial traffic associations or conferences.

Mr. Pelley testified that the services of the traffic department of the Association are at the disposal of shippers and shipper groups, and that "frequently matters are brought to the attention of that department by such organizations as the National Industrial Traffic League and the Shippers Advisory Boards, or such regional organizations as the Southern Traffic League, or organizations of shippers in a particular line of business such as the West Coast Lumbermen's Association, or even individual shippers, for transmission to the various railroad organizations concerned, either through correspondence or through joint meetings. In other words, the traffic department of the A. A. R. is going to be a useful and convenient two-way channel of communication for persons and organizations, both in government and among the shippers of the railroads who are interested in traffic questions.

No attempt has ever been made by the Association to dictate to any railroad with respect to particular rates, or to restrict any railroad or group of railroads from acting freely on rate matters, Mr. Pelley continued on the following day.

"The effort of the Association of American Railroads, as evidenced by its resolutions and from actions in the matter of rates, fares and charges," Mr. Pelley stated, "was to prevent rate wars which had been repeatedly condemned by the Interstate Commerce Commission from the beginning of its existence, and to establish, if possible, a policy among the railroads to make any important changes in rates affecting large groups of railroads until the changes proposed had been thoroughly and carefully disclosed by the railroads directly effected by the proposed rate changes. The Association had not attempted to go beyond these objectives." Mr. Pelley testified that there is no provision in the plan of organization of the A. A. R. for disciplining any member road that does not follow recommendations made by the Association or its board of directors, and that in the entire history of the Association no railroad has been expelled or otherwise subjected to penalties or sanctions of any kind.

Maintaining that a national railroad organization "is necessary in order to handle cooperatively a great many questions of common interest which cannot be handled by the individual railroads with anything like the degree of efficiency that accompanies the handling of these questions collectively," Mr. Pelley said that the value of a central organization "was demonstrated beyond question in the recent war. In connection with the effort of the railroads to handle in time of war both war and civilian traffic, there arose daily constant need for cooperation with the Army and the Navy in order that the efforts of the railroads might be exerted just as if they constituted but a single railroad system, where the efforts of each railroad were coordinated with the work of every other railroad."

"The experience of the past decade and more," Mr. Pelley concluded, "had demonstrated the wisdom, indeed the necessity, of the formation of the Association of American Railroads as what the late Joseph B. Eastman so aptly described, at the time it was formed, as the 'more perfect union' which was required to enable the railroad industry to do its work better and better to meet its responsibilities to the people of the United States."

Freight Car Loadings

Loadings of revenue freight for the week ended August 10 totaled 899,084 cars, the Association of American Railroads announced on August 15. This was an increase of 689 cars, 0.1 per cent, above the preceding week, an increase of 29,082 cars, or 3.3 per cent, above the corresponding week last year, and an increase of 3,903 cars, or 0.4 per cent, above the comparable 1944 week.

Loading of revenue freight for the week ended August 3 totaled 898,395 cars, and the summary for that week as compiled by the Car Service Division, A. A. R., follows:

Revenue Freight Car Loading

For the Week Ended Saturday, August 3

District	1946	1945	1944
Eastern	171,053	161,982	160,953
Allegheny	194,915	192,056	194,248
Pocahontas	65,366	50,991	56,513
Southern	125,663	116,846	120,520
Northwestern	137,198	131,880	139,788
Central Western	138,203	140,182	141,804
Southwestern	65,997	69,973	75,768
Total Western Districts	341,398	342,035	357,360
Total All Roads	898,395	863,910	889,594
Commodities:			
Grain and grain products	56,392	63,651	52,299
Livestock	16,853	13,457	15,669
Coal	184,522	164,419	174,869
Coke	13,471	14,058	14,288
Forest products	48,812	46,161	50,066
Ore	71,030	74,419	82,165
Merchandise l.c.l.	123,463	104,399	104,967
Miscellaneous	383,852	383,346	395,271
August 3	898,395	863,910	889,594
July 27	910,513	886,430	909,490
July 20	921,496	882,648	902,092
July 13	895,080	883,543	903,901
July 6	679,785	726,663	744,347
Cumulative Total, 31 weeks	23,321,358	25,521,740	25,634,625

In Canada.—Car loadings for the week ended August 3 totaled 70,579 cars, as compared with 70,266 cars for the previous week and 70,421 cars for the corresponding week last year, according to the compilation by the Dominion Bureau of Statistics.

Totals for Canada:	Revenue Cars Loaded	Total Cars Rec'd from Connections
August 3, 1946	70,579	36,000
August 4, 1945	70,421	34,381
Cumulative Totals for Canada:		
August 3, 1946	2,072,187	1,049,104
August 4, 1945	2,123,707	1,134,973

July Employment

Railroad employment increased 1.44 per cent—from 1,329,724 to 1,348,918—during the one-month period from mid-June to mid-July, but the mid-July total was 7.05 per cent below the total for July, 1945, according to the preliminary summary prepared by the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission. The index number, based on the 1935-39 average, was 129.4

for July, as compared with 128.5 for the previous month and 139.2 for July, 1945.

July employment was above that of the corresponding 1945 month in two groups, the increases being 0.17 per cent in executives, officials and staff assistants and 1.34 per cent in transportation, other than train, engine and yard. The declines ranged from 4.26 per cent in the professional, clerical and general category to 15.86 per cent in the maintenance of way and structures group.

As compared with the previous month, there were increases in employment in all categories, ranging from 0.28 per cent in the professional, clerical and general group to 2.94 per cent in maintenance of way and structures.

Road Tests Completed on New 4,000-hp. Alco-G. E. Diesel

Tests on a new two-unit 4,000-hp. Alco-G. E. Diesel-electric locomotive have been completed on the Lehigh Valley, according to the American Locomotive Company. For 30 days the new locomotive was used on Lehigh Valley's fast passenger runs between Buffalo, N. Y., and Newark, N. J. During the entire test period, technicians and engineers of American Locomotive and the General Electric Company rode in the locomotive to check operations.

Results of the tests were not announced, but it was said that no "helper" engine was required on the runs over the Wilkes-Barre mountains in Pennsylvania, where one normally is used. On westbound runs the new engine was used on the "Black Diamond" and in the eastbound tests it pulled the "Maple Leaf."

French Public Works Minister Studies American Methods

Jules Moch, Minister of Public Works and Transportation of France, arrived in the United States on July 3 to study American methods in civil aeronautics, merchant marine, and railways.

The French minister visited one of the three plants producing steam locomotives for the French railways. Accompanied by a foreign passenger agent of the Pennsylvania, Mr. Moch looked over the Pennsylvania's "Broadway Limited" at New York before its run to Chicago, and was especially inquisitive regarding the accommodations for night travel and in the ways of making railroad travel more attractive, to meet the competition of the airways.

He also inaugurated the reopening of the French railroads' offices, closed during the war, at 610 Fifth avenue, in Rockefeller Center, New York.

Crosser Law Cited as Example of Socialistic Trend

The pressure of organized minorities has given this country "a good deal more socialism than democracy" in the past 15 years, Robert M. Edgar, assistant to the president of the Maine Central and Boston & Maine, said in speaking before a recent meeting of the Lewiston-Auburn (Me.) Rotary Club.

Railroads have been used as guinea pigs in the latest congressional episode, the Crosser bill to "liberalize" the railroad retirement and unemployment acts, the speaker argued. "The trend toward socialism is gradual—in fact, so gradual that we become conditioned to each step and do not realize what has happened until we are face to face with a situation which makes us take account of stock," he observed.

The railroads have been "living with" government control for a good many years, Mr. Edgar continued. The railroad industry was the first to have national labor practices regulated by a federal commission; and the first to be the subject of a nation-wide experiment in social security legislation; the first to have its prices and under the Railroad Retirement Act. "Private industry generally felt very little of this until the N. R. A. started off the long line of business regulations which became intensified during the war and which, despite pious promises to the contrary, show all evidence of being even more difficult to dislodge than pessimists predicted," he said. "This is not a question of the coal industry, the steel industry, the railroad industry or some other category of American business fighting its way alone. None of us can watch without concern what happens to some other large industry."

He urged such groups as the Rotary Club not to remain passive but to establish "closer contacts" with legislators. "Tell them your story. Offset the noise and pressure of the minority group with true facts and with common sense analyze these socialistic trends."

Alaska Gets Nine Army Diesels

Following reconditioning, nine 1,000-hp., 127-ton Diesel-electric switching locomotives are being transferred by the Army Transportation Corps to the Alaska Railroad, in order to "strengthen" that line and improve its facilities for handling War Department personnel and supplies, the Transportation Corps has disclosed. The reconditioning of these locomotives is part of a one-year program affecting 76 of that type which have been returned to this country out of 280 in the various theaters of operation. The work is being carried out in the Transportation Corps' railroad repair shops at Holabird, Md. and Ogden, Utah.

British Railwaymen to Study U. S. Maintenance Practices

A party of British railway engineers, headed by W. K. Wallace, chief civil engineer of the London, Midland & Scottish, at London, England, will visit the United States this fall to study recent railway engineering and maintenance practices developed in this country. Accompanying Mr. Wallace will be H. B. Everard, engineer (permanent way); R. L. McIlmoyle, engineer (structures); Dr. J. L. Martin, architect; and H. H. Dyer, engineer-signals and telegraphs, all of the L. M. S.

If proper transportation can be arranged, the party expects to arrive in the United States in time to attend the concurrent conventions of the Roadmasters and Maintenance of Way Association and the American Railway Bridge & Building Association, which are to be held in Chicago on September 17, 18 and 19. The party also expects to view the joint exhibits of the Railway Track Supply Association and the Bridge and Building Supplymen's Association at the same time.

Mr. Wallace last visited this country in 1938, when he made a similar tour during which he addressed the members of the Roadmasters and Maintenance of Way Association at their 53rd annual convention in September of that year.

British Convert Locomotives to Oil Burning

The Great Western Railway of England is extending its experiment with oil-burning locomotives to 25 "Castle" class engines, which are to be placed in service on main line runs between London, Bristol, the west of England and south Wales, it has been announced through British railways' headquarters in New York.

Ten freight locomotives already converted to oil-burning have been placed in service in south Wales, and the company is planning to convert eight more for freight traffic. A "Hall" class, general utility type locomotive, also recently converted, will soon be brought into express passenger service between London and Bristol.

Clean-Air Committee Formed by Chicago Railroads

A railroad sub-committee of the Clean-Air Committee of the Chicago Association of Commerce was formed in Chicago on August 13. T. F. Powers, assistant to the vice-president (mechanical) of the Chicago & North Western, was named as chairman of the group, and E. E. Chapman, mechanical assistant (research and engineering) of the Atchison, Topeka & Santa Fe, was selected vice-chairman. The 20-man railroad sub-committee will particularly study ways to reduce pollution of the air from smoke and ashes and from dust raised from the track by passing trains.

MacDonald Named Information Officer of O. D. T.

Appointment of John R. MacDonald as its information officer was announced this week by the Office of Defense Transportation. Mr. MacDonald previously was attached to the O. D. T. information staff in various capacities between December, 1942, and December, 1945. Prior to his present appointment, he was employed on the information staff of the War Assets Administration. Mr. MacDonald has been employed in government information work for over six years and has been affiliated with newspapers and press associations in New York and Newark, N. J., since 1925.

Illinois Central Reports on South American Trade

The Illinois Central has recently issued an attractive, illustrated booklet outlining the results of a commercial survey of South America, made during the last four months of 1945 by Philip A. Webb, Jr., general traffic agent at Chicago, and Jose M. Giralt, general agent at Havana, Cuba.

The pamphlet outlines the methods used in making the survey and reports in con-

siderable detail the results. It is the opinion of the group that United States manufacturers and business men can secure a substantial volume of profitable trade in the South American nations provided certain steps, which are carefully explained in the report, are taken. Of particular interest is a chart showing the potential flows of commodities between the United States and each South American country, and whether the volume of movement of these commodities will be heavy or light.

Copies of the study are available from Oliver J. W. Williford, Jr., manager, foreign freight traffic of the I. C., at Chicago.

Wage Negotiations in Canada Progress Slowly

Clifford Murchison, chairman of the Canadian National War Labour Board at Ottawa, has announced that the board has returned to the railways and some of the brotherhoods involved the applications for wage increases and changes of rules put forward recently.

The board has asked the parties to resume negotiations with a view to arriving at a settlement of the issues, subject to the consideration and approval of the board. The present applications involve three railway labor organizations—Division 4; the Brotherhood of Railroad Trainmen; and the Brotherhood of Railway and Steamship Clerks. Information from reasonably reliable sources indicates that the railways propose to discuss wage problems with all other railway brotherhoods as well.

Ex Parte 163 Argument Begins September 16 — Correction

Oral argument before the Interstate Commerce Commission in the Ex Parte 163 proceeding, wherein the Railway Express Agency is seeking a general increase in rates, will be held starting September 16 at the commission's offices in Washington, D. C., instead of September 18, as was erroneously reported in *Railway Age* of August 10, page 243.

Monon Speeds Freight Trains

The Chicago, Indianapolis & Louisville, on July 21 greatly shortened freight train schedules between Chicago and Michigan City, Ind., on the north and Indianapolis and Louisville, Ky., on the south, effecting time savings in the movement of freight of nearly 12 hr. in one instance.

From Chicago train No. 71 has been quickened so as to arrive at Louisville at 7:30 a.m. the next morning instead of 11:55 a.m., although its departure remains unchanged at 10 p.m. Train No. 73 continues to leave Chicago at 12:05 p.m., but arrives in Louisville at 11 p.m., the same day, as compared with 1:35 a.m. the next day under the old schedules.

The Monon's Michigan City-Louisville service is now operated in separate trains throughout instead of consolidating enroute with the Chicago-Louisville trains, effecting a saving in time under the new schedules of 4 hr. 15 min., southward and 10 hr. 45 min. northward. Under the new schedule, train No. 57 leaves Michigan City at 5:30 p.m., arriving in Louisville at 8 a.m. Northward No. 56 leaves the southern city at 7 p.m., and arrives at its destination 12 hr. later.

From Louisville to Chicago, train No. 72 has been speeded to leave Louisville at 10 a.m. instead of 9:15 a.m. and arrive in Chicago at 8:15 p.m., instead of 11 p.m. while train No. 70 now leaves at 8 p.m. and arrives at 6 a.m. A new train, No. 74, fulfills the approximate schedule formerly assigned to No. 70, leaving Louisville at 12:01 a.m. as compared with 3:30 a.m., and arriving in Chicago at 4:30 p.m. instead of 7:30 p.m.

Between Chicago and Indianapolis, schedule improvements have been effected by operating this service independently of the Chicago-Louisville service, and trains Nos. 91 and 92 have been extended to operate between Monon, Ind., and Chicago instead of running only between Indianapolis and Monon as before. No. 91 leaves Chicago at 11 p.m., arriving in Indianapolis at 6 a.m., while No. 92 leaves Indianapolis at 10 p.m. and arrives in Chicago at 5 a.m.

Service Order Violations Draw $1,000 Penalty

Secretary W. P. Bartel of the Interstate Commerce Commission announced on August 12 that the commission has been advised that on August 3, in the federal court at Sioux City, Iowa, the Great Northern confessed judgment in a complaint filed against it in the sum of $1,000 and costs. The judgment was entered on the same date.

The complaint, in 10 counts, was filed under the provisions of paragraph 17(a) of Section 1 of the Interstate Commerce Act, and charged the carrier with failure to observe the provisions of Second Revised Service Order No. 244 in furnishing empty cars to shippers for loading grain at Sioux City.

Chile Plans Electrification of Railroads

Plans to electrify some 320 miles of the main lines of the government-owned railway of Chile are reported to be in progress. Power would be provided by state-owned electric plants. Another undertaking under investigation, in cooperation with Argentina, is a new international tunnel in the Andes mountains to connect the railroads of the two countries. Such a tunnel, it is understood, would be at an elevation of some 8,400 ft., or 2,000 ft. lower than the existing tunnel, access to which is blocked for months each winter by snow.

First Quarter Loading Estimates Missed by 0.2 Per Cent

The thirteen regional Shippers' Advisory Boards underestimated carloadings for the first quarter of 1946 by 0.2 per cent, according to the latest comparison of the forecasts with actual loadings, issued this week by W. C. Kendall, chairman of the Car Service Division of the Association of American Railroads. The variations by individual boards ranged from an overestimate of 19.9 per cent to an underestimate of 11.5 per cent, while some of the variations by commodities were "very large," either over or under, ranging from an overestimate of 47.5 per cent, in the case of automobiles and trucks, to an underestimate of 52.4 per cent in the case of cement.

"Under the business conditions which existed in the first quarter of 1946, such variations can be understood," Mr. Kendall commented.

The report showed that there were overestimates in 14 commodity groups and underestimates in 16. Among the larger overestimates were chemicals and explosives, 37.9 per cent, metals other than iron and steel, 37.5 per cent, and hay, straw and alfalfa, 34.3 per cent. Among large underestimates were fresh fruits (non-citrus), 32.8 per cent, and cotton, 29.2 per cent. Of the five commodity groups with the largest loadings, the estimates were in error more than 8.5 per cent in only one, iron and steel, where there was a 29.4 per cent overestimate.

Comparison National Forecast with Actual Loadings—First Quarter 1946

	Carloadings First Quarter		Percentage of Accuracy	
Dist. Board	Est.	Actual	Over Est.	Under Est.
Mid-West ..	858,385	840,967	2.0	
Great Lakes.	289,288	234,789	19.9	
Northwest ..	279,015	278,501	0.2	
Ohio Valley.	882,582	984,159		11.5
Trans-Mo-Kansas ..	348,160	366,394		5.2
Southeast ..	851,229	787,773	7.4	
Southwest ..	397,096	419,272		5.6
Atlantic States ...	602,867	585,641	2.9	
Allegheny ..	991,979	1,027,397		3.6
Central Western .	271,865	289,804		6.6
Pacific Coast	286,169	283,064	1.1	
New England	131,266	140,617		7.1
Pacific Northwest.	222,107	192,147	13.5	
Total	6,416,008	6,430,525		0.2

Five-Cent Air Mail Approved

President Truman on August 14 signed H. R. 5560, which authorizes a rate reduction from 8 cents per ounce to 5 cents per ounce on domestic air mail. Opposition to the measure was expressed for the railroads on July 12 by P. J. Schardt, chairman of the Committee on Railway Mail Transportation and assistant vice-president (mail and express) of the Southern, before the Senate committee on post offices and post roads, as noted in *Railway Age*, July 20, page 99.

State Commissioners Want Rate Proceedings Put Off

Postponement until at least December 15 of the scheduled September 4 rebuttal hearings at Washington, D. C., in Ex Parte No. 148 and Ex Parte No. 162 to permit the compilation of additional statistical evidence was asked this week in a petition filed with the Interstate Commerce Commission by the National Association of Railroad and Utility Commissioners, representing 46 state regulatory agencies. The petition also called for the commission to require 30 Class I roads to supply a forecast of net income for 1946 and 1947, including estimated carry-back tax credits for those years, adding that "only the railroads are in a position to furnish this information."

Describing the first five months of 1946 as 'probably the most abnormal in railroad history." the petition said that "without

data before it concerning railroad traffic in the months of August, September, October and November, the commission will have no reliable basis upon which to forecast the future revenue pattern of the railroads." It contended that the I. C. C. is entitled to have before it results of its recent authorization of temporary freight rate increments averaging 6.5 per cent when it takes into consideration the problem of additional increases.

The petition also observed that the Southern Pacific recently estimated a 1946 carryback of $61,591,000, which, the association said, erased its entire estimated federal income taxes, in addition to all other taxes, thereby resulting in a credit of $8,834,000. It further noted that a suggestion had been made by the commission at the recent Chicago hearings that the 1946 carry-backs of all roads may amount to approximately $1,000,000,000.

The association said that the commission, by taking all facts into consideration before granting an increase, will be able to formulate a rate structure "which will be valid for a longer period . . . and so avoid the necessity of re-examining the case after a comparatively short time."

Saturday Unloading of Coal Cars Asked

(*Continued from page 304*)

other users, great numbers of coal cars are needed for combined rail and water movements." He reported that the Lake ports movement of coal is "breaking all records" in order to reduce the present heavy deficit and predicted that the movement will continue for about the next four months "because it is imperative to get as much coal as possible to the head of the lakes by water in order to cut down the long overland hauls needed to transport any deficit existing when the Lake season closes."

The O. D. T. statement said that ocean export coal movement is over three times as heavy as last year and involves a number of long hauls and consequent increases in turn-around time. It added that Indiana and Illinois coal is being hauled to Gulf ports and that coal from Utah is being shipped to Long Beach, Calif., and Portland, Ore., for transshipment, involving rail hauls of 1,000 to 1,200 miles.

"O. D. T. records indicate that bituminous production for the weeks ended July 13, 20 and 27 averaged 12,500,000 tons, a record surpassed only by the 13,000,000 ton average weekly production achieved in March, 1926," the statement disclosed. "The three week total of 37,500,000 tons is almost 2,000,000 tons higher than for the corresponding weeks of 1945 and 850,000 tons higher than in the same weeks of 1944, a year in which total annual production of 620,000,000 tons of bituminous coal topped all previous records.

New Records—"Anthracite production, only slightly affected by a short work stoppage early in June, is running at high levels. Cumulative production to July 27 amounted to over 34,000,000 tons. The total is 2,688,000 tons over the 1945 production to the same date. Total loadings for the three weeks ended July 13, 20 and 27 were 377,000 tons and 282,000 tons higher than for the same weeks of 1945 and 1944."

The O. D. T. also observed that weekly revenue carloadings of all coal during July were at "near record" figures. It said that loadings for the week ended July 20 topped 190,000, the highest loading since February, 1936, while the tonnage dumped at the Lake ports for the week ended July 29, amounting to 2,010,500 tons, represented an all time high. "Ocean export coal loadings to August 1 amounted to 10,323,000 tons compared with 3,005,000 tons for the same period of 1945," the statement concluded. "July shipments alone, amounting to 2,396,000 tons, exceeded the total shipped during the entire pre-war year of 1941 by 123,000 tons."

Onion, Sweet Potato Shipments Exempted from O. D. T. Order

The Office of Defense Transportation this week exempted certain shipments of onion sets and sweet potatoes from the carload freight requirements of General Order O. D. T. 18A, Revised. Shipments of onion sets are exempted under General Permit O. D. T. 18A, Revised, -12 when the origin point is in Illinois, Indiana, Michigan, Minnesota or Wisconsin and when the quantity loaded in each car is not less than 24,000 lb. The permit expires September 15.

Shipments of sweet potatoes are exempted under General Permit 13 when the origin point is in Maryland or Virginia and the destination is east of the eastern boundary of Minnesota and the Mississippi river south to New Orleans, La., and when the quantity loaded in each car is not less than 20,000 lb. This permit expires November 30.

General Order O. D. T. 18A, Revised, prohibits the shipment of freight at carload rates unless the quantity shipped equals or exceeds the marked capacity of the car.

Car Service Order

Service Order No. 575, which the Interstate Commerce Commission issued on August 9, prohibits preicing of cars to be loaded with potatoes in Idaho, Oregon or Washington, subject to permit issued by Directer Clinger of the commission's Bureau of Service. The order became effective August 12 and will expire September 12.

Wheeler-Reed Bill Vetoed by Truman

(*Continued from page 305*)

Senate railroad investigation. I refer to the abuse of diverting, under cover of a reorganization plan, the funds of a railroad for the purchase of its own stocks in the market."

But Mr. Truman also found some desirable features in the legislation. He commended particularly the emphasis on the consideration given to the public interest, and the interest of the properties, in reorganizations. This is a principle, his memorandum continued, which "requires among other things that reorganization shall place control of railroads in persons primarily concerned with transportation for the communities served and for the nation as a whole, without any strings direct or indirect, conditional or otherwise, to institutions or others in distant financial centers.

Upholds Equities' Participation — "Such regard for the public interest will also help the stockholders, whether they be railroad employees who have invested in the stocks of the companies for which they work, or ordinary investors, desirous of safeguarding their investment, but not of helping any interest to capture control of their railroad. These stockholders, whom the bill justly seeks to protect against forfeiture, can and should get such protection, but without enabling any financial interest to use such legislation to acquire control."

A bill that would retain these features that he considers desirable, and modified to meet the objections he expressed, would meet Mr. Truman's approval, it appeared from his statement that "I believe that the next Congress can pass a bill which will meet the stated objections and which will be in the best interests of the public, the railroads, the bondholders and other creditors, and the stockholders."

Chesapeake & Ohio to Replace All Main Line Passenger Cars

The Chesapeake & Ohio, the New York, Chicago & St. Louis, and the Pere Marquette are contemplating the complete replacement of all their main line passenger equipment, according to an announcement by Robert R. Young, chairman of the C. & O. board. Inquiries have been placed with carbuilders for the new equipment needed to complete the replacement program and Mr. Young said the equipment "should be the finest ever placed in operation on the railroads."

The equipment embraced in the inquiries addressed to the car manufacturers will supplant that of the two new streamlined "Pere Marquettes" on the Detroit-Lansing-Grand Rapids run. They would supply also the units for other trains on the Chesapeake & Ohio which already has under construction two de luxe streamliners. These streamliners, being built by the Budd Company, will introduce many new features conducive to passenger comfort and safety, including ultra-modern air purification and sanitation, and observation vista domes, the announcement says. They will include a motion picture theater, art and industrial exhibits, news ticker, travelog and liberty service, curved aisles for smooth passage through trains, spacious lounge area in every coach, special facilities for the care and entertainment of children, telephone for passenger use while train is in motion, and a dining system which will eliminate waiting for meals. They will be powered by coal-burning, steam turbine electrically-driven locomotives now being built by the Baldwin Locomotive Works and the Westinghouse Electric & Manufacturing Co.

"There are approximately 47,000 Pullmans, day coaches, diners and baggage cars in use in the country today," Mr. Young said. "If other railroads follow the Chesapeake & Ohio's example of complete replacement of their main line pass-

enger equipment, it will mean orders for at least 47,000 cars for delivery within the next few years. These figures contrast with only 40,000 cars actually built during the last 35 years under the old policy of 'The Public Be Jammed.'

"Would modernization of existing equipment and an aggressive travel promotion program create such a travel demand that 100,000 cars, instead of only 47,000, would be needed?" Mr. Young asked. "It is interesting to note that 100,000 cars at present-day cost of manufacture would involve an expenditure of nearly $10,000,000,000. Even if half this sum were saved through competitive buying and volume production, the near term contribution to employment and prosperity would far exceed the cumulative total from this source for the past 35 years. Constructive action in this and other directions by the railroads should go a long way in indefinitely sustaining full employment. Full employment in turn will generate a travel demand that will enable us to re-modernize. It is thus that free enterprise will be sustained."

Better Last Half, I. C. C. Bureau Says

(*Continued from page 306*)

of railway wage disputes." The trend, it adds, is "still upward."

Turning to the usual analysis of monthly financial reports, the bureau reports that the June operating ratio was 84.5 compared to 66.0 a year earlier. The net income before deduction of federal income and excess profits taxes in the year ended with June was a deficit of $182,509,000, compared to a credit of $1,935,123,000 in the year ended June, 1945. Tax credits augmented net income in the 1946 period by $273,194,000, as compared with a reduction due to tax accruals in the preceding 12 months of 64.8 per cent, making the net after taxes approximately $90,685,000 for the year ended June, 1946, as compared to $681,959,000 in the preceding period.

June freight revenues of the Class I roads on a daily basis were 22.6 per cent above May but 22.5 per cent below June, 1945, while passenger revenues were 19.4 per cent above May but 30 per cent below June, 1945. The bureau's June freight revenue index (based on the 1935-1939 monthly average as 100) was 182.3, compared to May's 148.7 and June, 1945's, 235.2. The passenger revenue index was 314.5 compared to 263.3 for May and 449.0 for June, 1945.

Loading Estimates—Taking a look at the carloading prospects, the "Comment" reports that, "assuming free marketing and demand, tempered by ability to move grain," the Production and Marketing Administration of the Department of Agriculture estimates August loadings of grain and products at 55,400 cars weekly, a decline of 11.8 per cent from the 1945 figure. September loadings, it predicts, may be 51,250 cars per week, or 3,900 under the 1945 result, while it is anticipated that the October weekly figure will be 56,800 cars, or 1.8 per cent above last year. August livestock loadings are expected to continue well above 1945 levels, reflecting the suspension of price ceilings, and loadings of 19,000 per week are forecast, 24.2 per cent over last year. September and October estimates are 21,600 and 27,400, respectively. Refrigerator car loadings likewise are expected to exceed last year, the predicted increase for August being 3.1 per cent.

Coal production is expected to continue through August at the present high level, and the report observes that manpower conditions in the Pocahontas and Southern districts have improved "markedly" over August, 1945. This part of the "Comment" concludes with the remark that most types of equipment continue in short supply, though it is expected that the modified general orders 18 and 1 of the Office of Defense Transportation, combined with punitive demurrage and other restrictions, should help the situation, "which is complicated by the five-day work week in many industries, as well as an increasing number of bad order cars."

Katy Opens New Bridge Over North Canadian River

Marking the completion of a construction project which has been under way for nearly a year and involves the expenditure of $500,000, main line traffic was opened recently by the Missouri-Kansas-Texas at a new crossing of the North Canadian river at Posey Hole, near Eufaula, Okla. The river crossing stretches for two miles across the river bottom and main channel and is expected to eliminate flood trouble which in the past has been the cause of many delays and tie-ups on the Katy.

C. V. Replies to Commission's Show-Cause Order

Replying to an Interstate Commerce Commission order to show cause why it should not be required "to provide adequate train order protection or adequate block-signal protection for the movement of track motor-cars on its line," service of which was noted in *Railway Age*, June 22, page 1233, the Central Vermont this week informed the commision that the installation of a block-signal system would be too expensive and that the issuance of train orders for the protection of section men would be "something more" than is asked of other roads of similar traffic density.

The commission's show-cause order followed its investigation of a head-on collision between a freight train and a track motor-car on the C. V. near Sharon, Vt., on April 24. The C. V. replied that it would be "highly impracticable" to provide train order protection for maintenance of way gange, pointing out that such a regulation would mean that every car would have to be accompanied by a conductor pilot and that numerous additional train order stations would have to be opened. Noting that all motor-car operators are required to have with them at all times copies of the latest available timetables, it said that "there is no excuse for a collision between a motor-car and a regular timetable train."

Pointing out that the foreman who was killed had three warnings of the approaching freight train prior to the collision, the road said that "it is our opinion that this accident was not the result of any inadequacy of rules nor method of motor-car operation, but was caused by the foreman's disregard of rules and warnings which had they been obeyed would have avoided the accident."

The road added that the foreman was in possession of a 7 a.m. train movement broadcast, which, it said, all members of the crew knew he had received. In addition, it said that he was warned before the motor-car started its trip that the freight train had not passed and that he received a third warning from the crew members as the train approached the motor-car.

At the same time, the C. V. listed several amended rules to its standard operating procedure governing the operation of motor-cars. The proposed amendments would, among other regulations, stipulate that motor-cars must not be run beyond their assigned limits unless otherwise authorized and that all motor-car movements, except those in their own assigned territory, must be authorized by a train dispatcher.

Monongahela Connecting Control Terminated by O. D. T.

Possession and control of the Monongahela Connecting was terminated by the Office of Defense Transportation on August 12. As noted in *Railway Age*, June 22, page 1233, the O. D. T. assumed control of the road on June 14 at the direction of President Truman following a dispute between the company and the Brotherhood of Railroad Trainmen. The O. D. T. said its action was taken as the result of the signing of an agreement settling the differences.

I. C. C. Advises Railroads to State Crosser Law Costs

Commissioner Clyde B. Aitchison, chairman of Division 2 of the Interstate Commerce Commission, this week replied to a letter written on August 1 to Chairman Barnard by J. Carter Fort, vice-president and general counsel of the Association of American Railroads, in which Mr. Fort, referring to the current and scheduled hearings before the commission in Ex Parte No. 162, pointed out that passage of H. R. 1362, the so-called Crosser bill, will cost the railroads an additional $85,000,000 in 1947.

As noted in *Railway Age*, August 10, page 233. Mr. Fort wrote that he was "taking this means of calling to your attention an important development, of which the commission will take judicial notice. It occurred subsequent to the conclusion of the presentation of the railroads' evidence in chief at the Chicago hearings."

Answering in the absence of Chairman Barnard, Commissioner Aitchison said that "the commission, of course, takes official notice of the public laws of the United States. Just how the particular law will affect a carrier which is subject to it we cannot note in detail. I suggest that you have this subject explored, if you think it necessary for our consideration in the above-titled cases [Ex Parte No. 148 and Ex Parte No. 162] and that the results be embodied in a suitable exhibit,

together with a supporting statement prepared by a competent witness whom you intend to tender. The exhibit and the statement should then be given publicity promptly and then testimony and the exhibit can be tendered at the beginning of the rebuttal hearing in Washington."

As reported in *Railway Age*, August 3, page 188, the rebuttal hearings will be held starting September 4 before Division 2 of the commission at its Washington, D. C., offices.

Katy to Dieselize System

The Missouri - Kansas - Texas has announced, through its president, Donald V. Fraser, that plans have been completed for the substitution of Diesel-electric locomotives for steam locomotives throughout the entire Katy system. The new equipment will be placed in operation as rapidly as it is received.

"Unusual Circumstances" Held to Justify Truck Operation

Even though the Interstate Commerce Commission has established, in the so-called *White Line* (*Rock Island*) *case* (reported in *Railway Age* of March 23, page 650), the ruling principle that trucking operations performed directly or indirectly by a railroad must be limited to service "auxiliary to, or supplemental of, train service," the possibility that "unusual circumstances" might justify departure from that rule was there recognized and stated, the commission points out in a report in the MC-F-3010 proceeding wherein it authorizes the Louisville, New Albany & Corydon to acquire operating rights under which truck service will be provided unrelated to that road's train service.

The Corydon's railroad line extends from Corydon, Ind., to a connection with the Southern at Corydon Junction, 7.7 miles, and in late years its business has been almost altogether in carload freight, as small shipments, especially between Corydon and Louisville, Ky., 25 miles by highway, generally have been trucked. The railroad, however, has operated a truck over roads more or less parallel to its own line for the transportation of mail and express and such l.c.l. traffic as is available on rail billing and at rail rates. In order to increase its revenues, and so to avert what was described as the probable abandonment of its rail line, it applied to the commission for authority to acquire the rights of one Leona Meerman to operate as a common carrier trucker between Corydon and Louisville, under all-motor rates, thus extending its truck operations beyond the territory served by railroad.

In approving this proposal, the commission, with Commissioners Lee, Rogers and Patterson dissenting without comment, took the position that the acquisition was in the public interest in that it would lessen the probability that the railroad might have to be abandoned, and that the circumstances properly justified an exception being made from the *Rock Island case* ruling. Limitation of the service to that which is auxiliary to or supplemental of rail service is not possible in this instance, it held, as only one point on the truck route is a station on the railroad. The need for the truck service between Corydon and Louisville, it said, is "clear," and "continuance of that service under the influence and control of the small railroad here involved may properly be approved," as an exception warranting a departure from precedent.

A list of Current Publications appears on page 323.

Materials and Prices

The following is a digest of orders, notices and information that have been issued by the Office of Price Administration and the Civilian Production Authority, since August 5 and which are of interest to railways:

Construction—More than $53,000,000 worth of nonhousing construction was denied authorization throughout the nation by C. P. A. during the week ending July 25, including 1,440 applications for commercial, industrial and institutional construction valued at $53,707,357. Applications valued at $56,770,072 were approved.

Nonferrous Metals—The government's program for the importation of scarce nonferrous metal, ores and concentrates will continue on the same basis that prevailed June 29, Reconversion Director Steelman announced in letters to the O. P. A., C. P. A. and R. F. C.

Resin—Phenolic resin molding compound will be allocated by C. P. A. after Sept. 1, under Schedule 121 to Order M-300. An amendment to Priorities Regulation 28 removes this plastic from the list of materials eligible for priority assistance.

Steel—C. P. A. has restored normal operation of the CC preference rating system on iron castings and steel, suspended at the time of the steel strike, in amendment of Priorities Regulation 28, effective Aug. 7. Application for such ratings may be made immediately on Form C. P. A. 541-A.

Surplus—C. P. A. directives on surplus property held by W. A. A. hereafter will be issued only in cases of extreme public emergency, under a tightening of the directive system in Direction 3 to Priorities Regulation 13.

Prices

Building Materials—O. P. A. has temporarily adjusted ceilings for five building and construction materials, in cases of resellers selling under area pricing orders, to reflect increases in producers' prices since enactment of the price control extension act. Supplementary Order 172 is effective Aug. 8.

Bushings and Bearings—Increases ranging from 1 to 2½ cents a pound in ceilings for nonferrous bushings and journal and sleeve bearings have been authorized in O. P. A. order 668 under revised Regulation 136 effective Aug. 8.

Lighting Fixtures—Manufacturers of lighting fixtures and parts have been given a 10 per cent interim increase over their base ceiling prices for these products in O. P. A. Order 667 under Revised Regulation 136, effective Aug. 13.

Logs—Ceilings on all West Coast logs, except No. 2 wood logs and cull logs, have been increased $3 a 1,000 feet log scale, as required under the new price control law, in O. P. A. Amendment 25 to Revised Regulation 161, effective Aug. 8.

Logs—Contract loggers who perform services of felling, bucking, skidding, and assembling, have been authorized to accept payments from plywood manufacturers above ceiling prices, but within the amount of the premium payments for peeler logs authorized by the housing expediter, according to Amendment 3 to O. P. A. Regulation 503, effective Aug. 13.

Poles—To restore the normal price differential between 35 and 40-foot poles produced in eastern United States, O. P. A. has increased prices of 40-foot lengths and decreased ceilings for 35-foot lengths, in Amendment 6 to Regulation 559, effective Aug. 13.

Screw Machine Products—An interim additional increase of 1.9 per cent in the ceiling prices of screw machine products made entirely of brass has been authorized by O. P. A. in Order 670 under Revised Regulation 136 and Amendment 49 to Revised Regulation 136, both effective Aug. 8.

Shellac — Existing dollar-and-cents ceilings for unbleached shellac have been revoked, and new formula ceilings established under the maximum import price regulation in Amendment 1 to Regulation 245, effective Aug. 6.

Veneer — Individual producers of commercial veneer who experience hardship under industry-wide price ceilings may apply for price adjustments under the standards set for specified forest products in Amendment 3 to Supplementary O. P. A. Order 128, effective Aug. 13.

* * *

Governor John C. Vivian of Colorado presents illuminated scrolls to the conductors having 10 years' service on the "City of Denver." President George Ashby of the Union Pacific looks on

Supply Trade

July Freight Car Orders Show Sharp Increase

Increased deliveries of railway freight cars and larger orders during the month of July have been reported by the American Railway Car Institute. Orders for domestic freight cars more than tripled the previous month, totaling 11,086, compared to 3,064 placed in June. The increase in deliveries, the Institute said, reflected the resumption of operations at plants which had suffered shutdowns because of a lack of materials. Deliveries in July totaled 2,570, considerably below the capacity of the industry, but an increase over the 2,094 cars delivered in June.

The report showed that freight car orders placed with car builders during the first seven months of 1946 totaled 26,248, while deliveries for that period amounted to 16,852. Total domestic freight cars on order with car builders and undelivered as of August 1 were 41,666. Included in the report were figures for company shops which showed new orders for 4,150 freight cars and deliveries of 863 during July.

Ernest D. Grinnell, formerly general freight agent on the St. Louis Southwestern, has been appointed general traffic manager of the **Gaylord Container Corporation,** with headquarters at St. Louis, Mo.

E. W. Chapman, formerly chief engineer of the Blackmer Pump Corporation, has been appointed chief engineer of the newly-created industrial pump division of **Bowser, Inc.**, with headquarters in Fort Wayne, Ind.

Arthur C. Wilby, who has been in charge of public relations for subsidiary companies of the **United States Steel Corporation** at Chicago, has been elected a vice-president of U. S. Steel, with the same headquarters.

Willard M. Broxham has been appointed manager of sales for the fabricated plate division of the **Graver Tank & Manufacturing Co., Inc.** He formerly managed the concern's Philadelphia, Pa., office and now makes his headquarters at the general offices in East Chicago, Ind.

The **Liquid Conditioning Corporation** has announced the election of the following officers: **S. B. Applebaum,** president; **H. L. Tiger,** vice-president and treasurer; **Norman L. Brice,** secretary and chief engineer; **S. S. Sulzycki,** assistant secretary and controller. The company, located at 423 West 126th street, New York, provides equipment and materials for all water conditioning processes for industrial, municipal, railroad and household use.

Frederick D. Foote and associates have purchased the interests of the estate of **Beram D. Saklatwalla** in the **Alloys Development Company.** These interests include, among others, the Cor-Ten and Aldecor patents. Plans announced by Mr. Foote for the future of his company contemplate an expanded research program and a broadened engineering service to assist the trade in the proper employment of the properties of low-alloy, high-strength, corrosion-resistant steels. Research activities of the company are conducted in the research laboratory of the University of Pittsburgh.

W. E. Lunger, whose appointment to succeed Robert W. Ward as district manager of the Huntington, W. Va., plant of the **American Car & Foundry Co.** was announced in the *Railway Age* for July

W. E. Lunger

27, was born in Danville, Pa., and moved to New York at an early age. Specializing in engineering, he attended Columbia University and augmented his studies by working at the firm's Berwick, Pa., plant, where he received two years' training in shop work. In 1916, Mr. Lunger was appointed field inspector for American Car & Foundry export. Assigned to the Huntington plant in January, 1923, as mechanical engineer, he served in that capacity until 1937, when he was appointed general superintendent of the plant, holding that position until his recent appointment.

Max Riebenack III, manager of the Philadelphia (Pa) office of the **Industrial Brownhoist Corporation,** Bay City, Mich., has been elected vice-president in charge of sales, with headquarters at Bay City, succeeding **James B. Hayden,** who has retired. The corporation has announced the following additional changes in its sales organization: **H. D. Wright,** manager of the New York office, becomes director of sales for the eastern seaboard, with headquarters at New York; **C. H. White,** district sales manager at Chicago, becomes director of sales for the southern and western portions of the United States, with headquarters at Chicago; **James A. Peppard** continues as district sales manager of the central region, with headquarters at Cleveland, Ohio; **A. P. Lyvers,** assistant district sales manager at Chicago, becomes district sales manager, with the same headquarters; **Stanley See,** recently released from the armed forces and formerly in the sales department at Bay City, becomes district sales manager at Philadelphia, Pa.

John E. Goble has been elected president of the **National Tube Company,** a subsidiary of the United States Steel Corporation. He has been succeeded as vice-president in charge of sales by **William F. McConnor,** formerly general manager of sales. **Marcus J. Aurelius** has been elected sales vice-president of the **United States Steel Supply Company,** another United States Steel subsidiary, to succeed **Leslie B. Worthington,** whose election as president to succeed Ernest E. Aldous, retired, was reported in the *Railway Age* for July 20. **Arthur C. Wilby** has been elected vice-president of the **United States Steel Corporation.**

Fairbanks, Morse & Co. has announced a country-wide expansion of their railroad division. **E. A. Foster,** formerly with the Electro-Motive division of the General Motors Corporation, has been appointed manager of the application engineering department of the railroad division, with headquarters in Chicago. **J. F. Weiffenbach,** who for the past 10 years has been a locomotive engineer and designer for the Electro-Motive division of General Motors, has been appointed chief engineer of the railroad division, also with headquarters in Chicago. **Frank Ross, Jr.,** formerly assistant in the railroad division, has been appointed sales engineer in charge of locomotive sales in the St. Louis, Mo., area. **Frank M. Bosart,** formerly with the Electro-Motive division of General Motors, has been appointed eastern manager of locomotive sales and will be located in the company's New York branch. **Robert Aldag, Jr.,** formerly with the Chicago, Burlington & Quincy, has been appointed sales engineer in the Chicago district.

OBITUARY

Robert E. Medland, office assistant of the Pullman-Standard Car Manufacturing Company, Chicago, died in a hospital in that city on August 12.

Robert E. Frame, president of Standard Car Sales, Inc., and vice-president of the Standard Car Truck Company, Chicago, died at his home in that city on August 7.

Edwin N. Hazlett, railway and utilities sales engineer in the Cleveland, Ohio, office of the Phelps Dodge Copper Products Corporation, died in St. Petersburg, Fla., on July 10. He was 41 years old.

RAILROADER A RANGER. — Luther A. Thomas, assistant to vice-president (in charge of investigation and police), of the Southern, has been named an honorary Texas Ranger. The commission, bearing the seal of the State of Texas and the signatures of Governor Coke R. Stevenson and Secretary of State Claude Isbell, confers "all rights, privileges, and emoluments appertaining to said office."

Equipment and Supplies

Turkey to Buy Equipment

The Turkish Information Office, Washington, D. C., has announced that the Turkish purchasing commission headed by the general manager of the State Railways Administration, which recently arrived in this country, has plans to buy railway equipment valued at approximately $30,000,000.

The purchases, it is understood, will include 1,500 20-ton 4-wheel box cars, 1,000 20-ton 4-wheel high-side gondola cars, 100 40-ton 8-wheel low-side gondolas, 50 35-ton 8-wheel flat cars, 75 4-wheel tank cars, 150 17½-ton 4-wheel refrigerator cars, 75 35-ton 8-wheel ballast cars, 40 steam locomotives of the 2-10-0 type with a 4-ft. 8½-in. gage and 20 steam locomotives of the 2-12-0 type. (Capacities are given in metric tons.)

LOCOMOTIVES

The Argentine State Railways are inquiring for 5 to 50 steam locomotives. The types being considered are the 4-6-2, the 2-8-2 and the 4-8-2.

The Erie has ordered nine 1,000-hp., six 660-hp. and one 380-hp. Diesel-electric switching locomotives from the American Locomotive Company. Also, two 1,000-hp. and two 660-hp. Diesel-electric switching locomotives have been ordered from the Baldwin Locomotive Works.

FREIGHT CARS

The Gulf, Mobile & Ohio is inquiring for 1,500 box cars.

The Seaboard Air Line is inquiring for 150 70-ton covered hopper cars.

The Nashville, Chattanooga & St. Louis is inquiring for 500 50-ton box cars, 300 50-ton hopper cars and 200 50-ton gondola cars.

The Northern Pacific has ordered 250 40-ton refrigerator cars from the Pacific Car & Foundry Co. Inquiry for this equipment was reported in the *Railway Age* for June 15, page 1201.

The Illinois Central has ordered 400 50-ton steel hopper cars from the General American Transportation Corporation. This is part of the equipment for which an inquiry was reported in the *Railway Age* of June 15, page 1201.

The Pacific Fruit Express has placed orders for 3,000 additional refrigerator cars, divided as follows: The Mount Vernon Car Company, 1,000; the Pacific Car & Foundry Co., 500; the General American Transportation Corporation, 500; the American Car & Foundry Co., 500, and the Pullman-Standard Car Manufacturing Company, 500. Decision of the Pacific Fruit Express to order the new equipment was reported in the *Railway Age* of July 27.

SIGNALING

The International Great Northern has ordered materials from the General Railway Signal Company for the installation of absolute permissive block signaling between Palestine, Tex., and Oakwood, 18 miles, and between Hearne, Tex., and Taylor, 55 miles. Type D signals, Type G signals, Type K relays, and Model 7 switch circuit controllers are included in this order.

The St. Louis Southwestern has placed an order with the Union Switch & Signal Company for the signal materials required for the installation of centralized traffic control between Lewisville, Ark., and Texarkana, a distance of 30 miles of single track and constituting an extension to the existing C. T. C. installation between Pine Bluff and Lewisville, with the entire territory to be controlled from Pine Bluff. Besides the necessary additions to the control machine, the order includes coding equipment units, Style H-2 searchlight high and dwarf signals, SL-6A electric switch locks, U-5 switch circuit controllers, M-2 electric switch layouts, with required relays, rectifiers, transformers and housings. The installation work will be handled by the construction forces of the railroad.

The Baltimore & Ohio has ordered equipment from the General Railway Signal Company to replace a mechanical interlocking at Eastwick, Pa., and one at Schuylkill river drawbridge, with one all-relay electric interlocking. The control machine, to be located in the bridge operator's control room, will have an 18-in by 40-in. panel equipped with 16 track indication lights, 4 bridge indication lights, 13 switch and lock levers, and 17 traffic levers for the control of 13 switch machines, 3 electric locks and 14 color-position-light signals. A double-track and a single-track junction of the Reading with the Baltimore & Ohio will be included in the area controlled. Type B plug-in relays, Model-5C electric switch machines, Model 7 switch-circuit controllers, and Model-10 electric switch locks will be used in this installation.

The Chicago, Milwaukee, St. Paul & Pacific has placed an order with the Union Switch & Signal Co. for the materials required for the installation of automatic block signaling under the control of the train dispatcher on 190 miles of single track between Mobridge, S. D., and Marmarth, N. D. Sections of 123 miles between Mobridge and Hettinger and 15 miles between Rhame and Marmarth will be controlled from the dispatcher's office at Mobridge. Coded carrier equipment will be used to handle part of the section. In addition to the control machine and coded carrier equipment, the order includes the materials for coded track circuits, Style H-2 searchlight high and dwarf signals, Style M-22B electric switch layouts, Style U-5 switch circuit controllers and the necessary rectifiers, relays, housings, and junction boxes. The construction work will be done by railroad forces.

The Missouri Pacific has ordered equipment from the General Railway Signal Company for the installation of two all-relay electric interlockings, one at Memphis, Tenn., and one at Briark, Ark. The Memphis installation will be controlled from an office on Kentucky street. The table model control machine will have an 18-in. by 20-in. panel equipped with 10 track indication lights, 4 switch levers, and 6 signal levers for the control of 4 switch machines, 3 electric switch locks and 12 signals at 3 crossovers and a turnout in the Memphis terminal area. The Briark machine, also a table model, will have a 12-in. by 17-in. control panel equipped with 11 track indication lights, 5 switch levers, and 6 signal levers. It will control 5 switch machines, 2 electric switch locks, and 12 signals at an end of double track and a double crossover at Briark, and it will also control 2 switch machines and 8 signals at a passing siding at Almont, about 2.8 miles from Briark. These orders include Model 10 electric switch locks, switch roller bearings, Type G signals, and Model 5D dual-control switch machines.

Financial

Arcata & Mad River.—*Deficit Status.*—The Interstate Commerce Commission, in a report on reconsideration, has dismissed the proceedings in Finance Docket No. 5045, wherein Division 4, also in a report on reconsideration, as noted in *Railway Age*, August 11, 1945, page 270, affirmed its previous finding, as reported in *Railway Age*, November 11, 1944, page 740, that this 7.5-mile road is not entitled to compensation for losses claimed as a result of federal control of the railroads during and following World War I under the provisions of Section 204 of the Transportation Act of 1920. The applicant, upon petition and oral argument, alleged that Division 4 had erred in its statements, conclusions and findings. The commission, however, commented that "we find that the foregoing findings, insofar as any of them are at variance with those of the division, do not substantially affect the conclusions on which the division predicated its ultimate finding," adding that "we further find no error in the division's ultimate finding, that no amount may be certified to be due the claimant under the statute and that the claim should be dismissed."

Commissioners Aitchison, Mahaffie and Alldredge dissented.

Baltimore & Ohio.—*Stock of Alton Affiliates.*—This road has asked the Interstate Commerce Commission for authority to sell the stock it holds of three subsidiaries of the Alton, including 7,413 shares of guaranteed 7 per cent Joliet & Chicago; 3,617 shares of guaranteed 6 per cent preferred and 23 shares of guaranteed 7 per cent common of the Kansas City, St. Louis & Chicago, and 1,576 shares of guaranteed 7 per cent preferred of the Louisville & Missouri River. The stock has a par value of approximately $2,000,000.

The B. & O. said it paid $1,520,541 for the stock of the three companies originally acquired and that it has since added to its holdings. An I. C. C. provision at the time the purchase was authorized prevented the

B. & O. from selling, pledging or repledging the acquired stock.

According to the application, the stocks were acquired primarily for investment and "strategic" purposes, but are now only of investment value as the result of a commission finding that the B. & O. holdings of 250,000 shares of Alton stock, purchased in 1931, were valueless, so the road wishes to be able to effect their sale.

CENTRAL OF PENNSYLVANIA.—*New Directors.*—Andrew J. Sordoni and Earl T. Moore have been elected directors of this road. Mr. Sordoni, a former Pennsylvania state senator and president of the Commonwealth Telephone Company of Pennsylvania, the Sordoni Construction Company and the Sterling Hotel system, succeeds John R. Prizer, resigned. Mr. Moore, vice-president and general manager of the road and general manager of the Central of New Jersey, succeeds the late Shelton Pitney.

DELAWARE, LACKAWANNA & WESTERN.—*Control of Leased Lines.*—Division 4 of the Interstate Commerce Commission has authorized this road to purchase at $75 per share 16 shares of the stock of the Morris & Essex Extension, which, together with the 1,097 shares the applicant already holds, will give it control of that 1.92-mile line. The applicant has operated the M. & E. E. under lease.

Division 4 also has authorized this road to acquire, through stock ownership, control of the Hoboken Ferry Company and to lease for a period of 20 years the properties of that line, which it has operated under lease since 1905. The D. L. & W. owns all the outstanding stock of the New York & Hoboken Ferry Company, which, in turn, owns all the outstanding stock of the Hoboken Ferry. The applicant will acquire all assets of the N. Y. & H. F., including the stock of the Hoboken Ferry, for $600,000, representing part payment of the $2,495,000 principal amount of N. Y. & H. F. general mortgage 5 per cent bonds it now holds. In approving the transaction, the commission imposed employee-protection conditions similar to those prescribed under section 5(2) of the Interstate Commerce Act.

ST. LOUIS, SAN FRANCISCO & TEXAS.—*Trackage Rights.*—Division 4 of the Interstate Commerce Commission has authorized this road to acquire trackage rights over certain lines of the Texas & New Orleans at Fort Worth, Tex., and to use jointly the facilities of the Fort Worth Union Passenger Station Company. In approving the transaction, the commission imposed employee-protection conditions as set forth in section 5(2) of the Interstate Commerce Act. At the same time, the commission dismissed for want of jurisdiction an application by this road for authority to acquire trackage rights, for switching purposes only, over a line of the Gulf, Colorado & Santa Fe in Fort Worth.

SOUTHERN. — *Equipment Trust Certificates.*—This road has applied to the Interstate Commerce Commission for authority to assume liability for $7,880,000 of series LL equipment trust certificates, the proceeds of which, together with other funds, will be applied toward the payment of $9,860,000 for equipment, including 1,000 50-ton steel-sheathed automobile box cars, to be obtained from the Pullman-Standard Car Manufacturing Company, and six 6,000-hp. Diesel-electric road freight locomotives and 14 1,000-hp. Diesel-electric switching locomotives which the applicant proposes to purchase from the Electro-Motive Division of the General Motors Corporation. The certificates, to be dated September 15, would mature in ten equal annual installments.

Average Prices Stocks and Bonds

	Aug. 13	Last week	Last year
Average price of 20 representative railway stocks	62.16	61.41	53.11
Average price of 20 representative railway bonds	97.99	97.44	96.85

Dividends Declared

Maine Central. — 6% prior preferred, $1.50, quarterly, payable October 1 to holders of record September 25.

Construction

BALTIMORE & OHIO.—This road has awarded contracts to the Union Switch & Signal Co., Swissvale, Pa., for the installation of car retarders in its east-bound classification yard at Cumberland, Md., at estimated cost of $209,500; and to George Vang, Inc., Pittsburgh, Pa., for alterations to pier No. 1 and reconstruction of pier No. 2 of bridge No. 362 at Morgantown, W. Va., at an estimated cost of $27,232.

RICHMOND, FREDERICKSBURG & POTOMAC.—This road has awarded a contract to Haley, Chisholm & Morris, Charlottesville, Va., for grading and masonry work on approximately five miles of third track. The estimated cost of the project is $300,000.

SOUTHERN.—This road has awarded a contract to the Mt. Vernon Bridge Company, Mt. Vernon, Ohio, for the steel work involved in the renewal of the Broad Run bridge near Bristow, Va. The estimated cost of the project is $65,500.

Abandonments

ILLINOIS TERMINAL.—This road has applied to the Interstate Commerce Commission for authority to abandon a portion of its so-called Tilton branch, from Danville, Ill., to a connection with the Wabash at Tilton, 1.6 miles.

WYOMING.—Acting upon consideration of the record and at the request of the applicant, Division 4 of the Interstate Commerce Commission has dismissed, without prejudice, an application by this road, in the Finance Docket No. 15295 proceeding, wherein it sought authority to abandon its entire line, from Buffalo, Wyo., to Clearmont, 29 miles.

Railway Officers

Personnel Changes Follow Seaboard Reorganization

The recently reorganized Seaboard Air Line Railroad, formerly known as the Seaboard Air Line Railway, has announced the following changes in personnel:

EXECUTIVE

R. Parke Jones, vice-president and comptroller, has been named vice-president in charge of finance and accounting. **George B. Rice,** chief freight traffic officer, has been appointed vice-president in charge of freight traffic, express, and agricultural and industrial development. **W. A. Marshall** and **W. J. Hock,** assistants to chief freight traffic officer, have been appointed assistants to vice-president. **J. W. Smith,** assistant general superintendent (at Savannah, Ga.) has been named assistant to president.

FINANCIAL, LEGAL AND ACCOUNTING

William B. Pope, treasurer for the receivers, has been appointed treasurer, and **William F. Cummings,** secretary for the receivers, secretary. **William R. C. Cocke,** one of the counsel for the receivers, has been named general counsel, and **L. L. Knight** continues in his former post as comptroller.

OPERATING

C. H. Sauls, general superintendent, has been appointed general manager, succeeding **J. C. Wroton,** who has been granted a leave of absence. **C. A. McRee,** superintendent at Raleigh, N. C., has been appointed assistant general manager at Savannah, succeeding **J. W. Smith,** formerly assistant general superintendent, whose promotion is noted elsewhere in this column. The office of assistant general superintendent has been abolished. **R. M. Stone** succeeds Mr. McRee as superintendent at Raleigh. **C. I. Morton,** superintendent of station operations at Jacksonville, Fla., has been named assistant superintendent at Raleigh, while **J. A. Shea,** assistant superintendent of station operations at Jacksonville, succeeds him. **J. R. Thorne,** assistant superintendent, North Florida division, at Jacksonville, has been appointed superintendent there, and **L. C. Bates,** division trainmaster at Jacksonville, succeeds him as assistant superintendent.

SPECIAL

Warren T. White, special assistant to the receivers, has been appointed director of public relations. **Herman A. Benton,** executive general agent to the receivers, has been named director for personnel.

EXECUTIVE

Edward A. Ryder, whose appointment as assistant to the vice-president, traffic, of

the Canadian National, with headquarters at Montreal, Que., was announced in the August 10 *Railway Age,* was born in Havelock, N. B., and following employment with the Times Printing Company, Moncton, he enlisted in the Canadian Forces in 1917. On demobilization, he joined the operating department of the Intercolonial Railway

Edward A. Ryder

(now the C. N. R.) in 1920, serving in Moncton and Newcastle, N. B. Transferring to the Montreal offices of the Canadian National in 1924, he served successively in the rate and tariff bureau, foreign freight department and office of the general freight traffic manager. In 1938 Mr. Ryder was appointed chief clerk to the vice president in charge of traffic, and in 1944 he became assistant to the general freight traffic manager, which position he held up to his present promotion.

Carleton W. Meyer, whose appointment as vice-president—administration, of the American Bus Lines, with headquarters at Chicago, was announced in the August 10 issue of *Railway Age,* was born on August 27, 1903, at Madison, Wis., the son

Pach Bros., N. Y.

Carleton W. Meyer

of Dr. Balthasar H. Meyer, who was a member of the Interstate Commerce Commission from 1911 to 1939. He was graduated from the University of Wisconsin in 1924 with a B. A. degree and received his LL. B. from Harvard Law School in 1927. He was associated with C. C. McChord in law practice at Washington, D. C., from 1928 to 1929, when he became attorney for the Cambria & Indiana, J. H. Weaver & Co., and associated companies at Philadelphia, Pa., remaining in this capacity until 1931. From then until 1936 Mr. Meyer served as attorney for the Delaware & Hudson at New York. He went with the New York Central as commerce counsel at New York in October, 1936, and advanced to the post of assistant to president on August 1, 1940. He maintained the latter office of the New York Central until his recent appointment, effective August 16. Mr. Meyer has been a member of the Railroad Committee for the Study of Transportation, A. A. R., and chairman of its Air Transport subcommittee.

FINANCIAL, LEGAL AND ACCOUNTING

Edward Price, whose promotion to treasurer of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at St. Paul, Minn., was reported in the *Railway Age* of July 27, was born at St. Paul on March 26, 1887, and received his higher education at the University of Minnesota.

Edward Price

He entered railway service on July 26, 1902, as a water boy on the Omaha at St. Paul, the point which has been his headquarters throughout his career. He subsequently served in various minor capacities until November 15, 1916, when he was promoted to traveling accountant. On April 1, 1924, Mr. Price was advanced to general accountant, and five years later he became auditor of freight claims. On January 1, 1938, he was promoted to assistant treasurer, the position he held at the time of his new appointment.

G. A. Wallis, assistant to general auditor of the New York, Chicago & St. Louis, has been appointed auditor of disbursements, with headquarters as before at Cleveland, Ohio, succeeding **E. S. Lynch,** who has been appointed general accountant there.

OPERATING

Fred A. Dawson, whose appointment as general manager, lines Buffalo and East of the New York Central at New York was announced in the *Railway Age* of August 10, was born at Lima, Ohio, on July 1, 1891, entered railroading on January 1, 1910, as clerk in the office of the superintendent of freight transportation, Cleveland, Cincinnati, Chicago & St. Louis (now part of New York Central) at In-

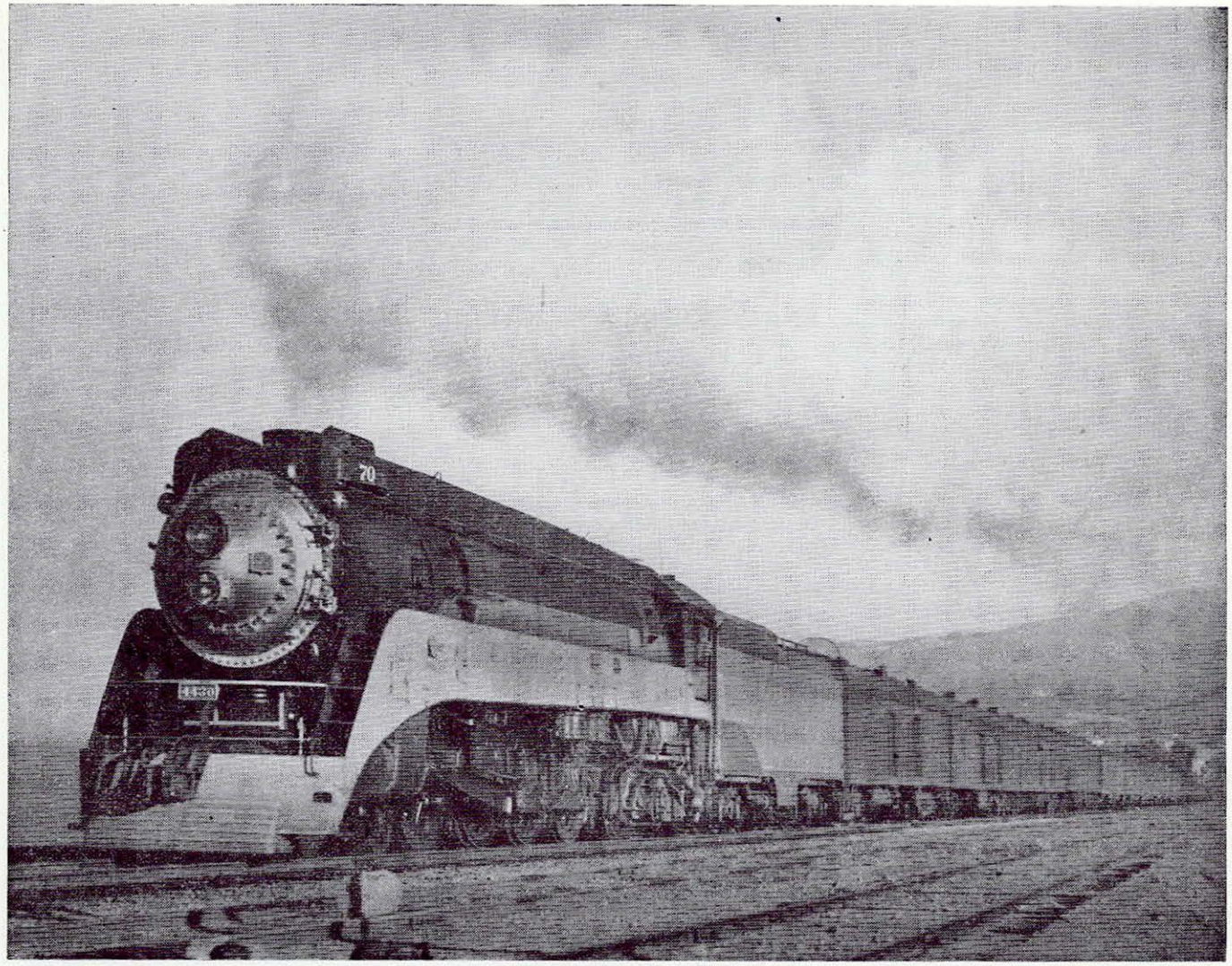
Fred A. Dawson

dianapolis, Ind. After working in the traveling agent's office, Mr. Dawson became chief clerk to the superintendent of car service on April 1, 1917. Three months later he was named inspector of transportation for the general superintendent at Indianapolis, and on January 1, 1918, he became supervisor of freight loading for the superintendent of freight transportation, at the same location. He was appointed chief clerk to superintendent freight transportation on March 1, 1925, and superintendent of car service on June 1, 1929. Named assistant superintendent of freight transportation in 1929, and superintendent of freight transportation at Indianapolis in September, 1937, Mr. Dawson became division superintendent of the terminal division at Cincinnati, Ohio, on December 1, 1942. On January 11, 1943, he was furloughed to the United States Government as assistant deputy solid fuels administrator for war at Washington, D. C. He returned to the New York Central on January 1, 1944, as superintendent of the Ohio division at Springfield, Ohio. Mr. Dawson was appointed manager, freight transportation, at New York later in 1944, and was serving in that capacity at the time of his recent appointment, effective August 1.

D. F. Savage, assistant superintendent of the Virginian, with headquarters at Princeton, W. Va., has also assumed the duties of acting chairman, Car Allotment Commission, succeeding **W. F. League,** who has retired at his own request after 29 years of service with the Virginian.

Frank S. Worthington, whose appointment as assistant superintendent of the Southern at Sheffield, Ala., was announced in the July 27 issue of *Railway Age,* has been subsequently named superintendent of the New Orleans & Northeastern (a part of the Southern) at Hattiesburg, Miss., succeeding **Fred A. Burroughs, Jr.,** whose photograph and biography appear elsewhere in these pages. **Karl C. Shults,** trainmaster of the Washington division of the

News Department continued on next left-hand page



Sustained Speed . . . a first essential

To keep pace with the demands of the traveling public, in the years just ahead, the maintaining of faster train schedules will be a first essential.

To do this will require motive power capable of handling heavy trains at high speeds—and of sustaining such speeds on long runs.

Modern Lima-built steam locomotives not only meet these exacting demands, but operate with maximum efficiency and economy.

LIMA LOCOMOTIVE WORKS LIMA LOCOMOTIVE WORKS INCORPORATED INCORPORATED, LIMA, OHIO

Southern, with headquarters at Charlottesville, Va., has been appointed assistant superintendent of the Birmingham division at Sheffield, succeeding **E. Rogers Oliver, Jr.**, whose photograph and biography appeared in the August 3 issue of *Railway Age,* in connection with his advancement to division superintendent at Winston-Salem, N. C. **John P. Mumford,** trainmaster on the east end of the Birmingham division, has been transferred to succeed Mr. Shults at Charlottesville, while **Edmund D. Singleton,** trainmaster on the west end of the Birmingham division, succeeds Mr. Mumford as trainmaster on the east end. **J. Garland Woodall,** trainmaster at Hattiesburg, succeeds Mr. Singleton on the west end of the Birmingham division. **Edwin E. Brown,** car service inspector at Columbia, S. C., has been appointed trainmaster of the Columbia division there.

TRAFFIC

James B. Thom, whose appointment as European traffic manager of the Canadian National, with headquarters at London, England, was announced in the August 10 *Railway Age,* was born in Montreal, Que., on February 23, 1893, and was graduated from McGill University (B. S., 1915). He first entered railroading during the summer of 1911 in the engineering department of the Grand Trunk (now the C. N. R.) at Toronto, Ont., then again served the Grand Trunk during 1913-1914 in the valuation department at Chicago. In World War I he served with the Royal Canadian Engineers in England, Belgium, and France, and was awarded the Military Cross in 1918. After demobilization in 1919 he joined the Lehigh Valley as assistant engineer in the valuation department at New York. Mr. Thom went with the Canadian National in 1924 in the foreign freight department at Montreal, serving in various capacities until he was appointed special traffic representative to the general freight traffic manager. In 1936 he became assistant to the vice-president of traffic there, which post he maintained until his recent appointment.

James B. Thom

Frank Wall, traveling freight agent of the Chicago, Burlington & Quincy, at Winnipeg, Man., has been promoted to general agent, with the same headquarters, succeeding **H. A. McMahon** who has retired.

J. A. Martin, assistant to freight traffic manager of the Baltimore & Ohio, has been appointed general freight agent, with headquarters remaining at Baltimore, Md.

Beeber Gross, general agent of the Reading at New York, has been appointed industrial agent, with headquarters at Philadelphia, Pa., succeeding **W. M. Potts,** deceased.

ENGINEERING & SIGNALING

G. L. Field, assistant engineer of the Canadian National at Toronto, Ont., has been appointed division engineer at Capreol, Ont., succeeding **J. A. Des Trois Maisons,** who has been transferred to Montreal, Que.

H. J. Fast, assistant division engineer of the Canadian National at London, Ont., has been appointed division engineer at Hornepayne, Ont., succeeding **D. M. Trotter,** who has been transferred to Montreal, Que.

J. F. Salmon has been appointed bridge engineer of the Canadian National at Toronto, Ont., with jurisdiction over the central region, succeeding **C. P. Disney,** who has retired at his own request after long service.

MECHANICAL

F. A. Rogers, electrical supervisor of the New York, New Haven & Hartford, has been appointed engineer, electric lighting and distribution, with headquarters as before at New Haven, Conn.

C. E. Miller has been appointed superintendent, air brake equipment and steam heat, of the New York Central at New York. **J. H. Russell** has been named assistant superintendent, air brake equipment and steam heat, at New York. **L. H. Albers,** supervisor of air brakes at Albany, N. Y., retired on July 31, after many years' service.

The New York Central has announced that the title, division air brake inspector, held by the following officers, has been changed to supervisor of air brakes and steam heat: **W. R. McHenry,** Grand Central Terminal, New York; **E. F. Cooper,** Albany, N. Y.; **J. J. Barry,** Buffalo, N. Y.; **J. Kane,** Syracuse, N. Y.; **H. Sundin,** Avis, Pa.; and **R. R. Winne,** West Springfield, Mass.

PURCHASES AND STORES

Benjamin T. Wood, whose retirement as chief purchasing officer of the St. Louis-San Francisco, with headquarters at St. Louis, Mo., was reported in the *Railway Age* of August 3, was born at Springfield, Mo., on December 31, 1878. He entered railway service in July, 1897, as a stenographer on the Kansas City, Fort Scott & Memphis (now the Frisco) at Springfield, and from 1899 to 1901 he served as secretary to the general superintendent, being transferred to the office of the vice-president and general manager one year later. In October, 1903, Mr. Wood went with the Chicago, Rock Island & Pacific as secretary to the third vice-president, with headquarters at Chicago, becoming secretary to the president in April, 1904, and chief clerk to the president in 1905. In September, 1909, at a time when the Rock Island and the Chicago & Eastern Illinois were operated as one property, he went with the latter road as chief clerk to the president, with the same headquarters. Two years later Mr. Wood returned to the Frisco as assistant to the vice-president at St. Louis, and from May, 1913, to October, 1916, he was assistant to the chief operating officer. In November, 1916, he was advanced to assistant to the president at St. Louis, and during the period of federal control he served as assistant to the federal manager of the Frisco and the Missouri-Kansas-Texas. On March 1, 1920, Mr. Wood was elected vice-president and chief purchasing agent of the Frisco, and in November, 1932, when the road went into receivership, he assumed the title he held at the time of his retirement.

SPECIAL

Fred Atkins Burroughs, Jr., whose appointment as chief personnel officer of the Southern, with offices at Washington, D. C., was announced in the August 10 issue of *Railway Age,* was born on June 15, 1905, at Raleigh, N. C., and attended Wake Forest College (B. A., 1929). He began his career in railroading in December, 1929, as a student apprentice for the Southern, becoming assistant supervisor at Princeton, Ind., in 1934, and advancing to track supervisor at Huntingburg, Ind., in 1936, then transferring to Pell City, Ala., in 1937. He was named assistant trainmaster at Somerset, Ky., in 1942, and promoted to trainmaster at Winston-Salem, N. C., in 1943, transferring to Alexandria, Va., in March, 1944. Mr. Burroughs was appointed assistant superintendent of the Birmingham division at Sheffield, Ala., in September, 1944; was advanced to superintendent of the Mobile division at Selma, Ala., in February, 1946; and was transferred to Hattiesburg, Miss., in March, 1946, as superintendent of the New Orleans & Northeastern, (part of the Southern). His recent appointment became effective on August 16.

Fred A. Burroughs, Jr.

Tables of Revenues and Expenses begin on next left-hand page

Rising fuel costs can be offset

WITH recently increased cost of locomotive fuels playing such an important part in the great rise in train operation costs, it is especially important at this time to study the fuel-saving possibilities of the Franklin System of Steam Distribution.

Application of this system to your existing or new locomotives *will* offset rising fuel costs.

The Franklin System of Steam Distribution, using poppet valves in place of piston valves, increases the efficiency of transforming steam into horsepower-hours. At normal operating speeds, for either freight or passenger locomotives, the increase in horsepower output will be 20% to 40% for the same steam consumption. For the same power output, fuel savings will be even more pronounced, have reached 45%.

We would like to show you how this can be done on your locomotives — either existing or new — for either freight or passenger service.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK • CHICAGO • MONTREAL

STEAM DISTRIBUTION SYSTEM • BOOSTER • RADIAL BUFFER • COMPENSATOR AND SNUBBER • POWER REVERSE GEARS
AUTOMATIC FIRE DOORS • DRIVING BOX LUBRICATORS • STEAM GRATE SHAKERS • FLEXIBLE JOINTS • CAR CONNECTION

REVENUES AND EXPENSES OF RAILWAYS

Month of June and Six Months of Calendar Year 1946.

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Railway tax accruals	Net railway operating income 1946	Net railway operating income 1945
Akron, Canton & Youngstown	June	171	$258,660	$136	$275,164	$58,753	$41,997	$23,009	$117,017	$259,809	94.4	$15,355	$11,609	$17,170	$25,609
	6 mos.	171	1,743,316	679	1,842,538	354,821	239,450	141,367	702,187	1,559,088	84.6	283,450	115,103	64,406	347,517
Alton	June	959	1,289,855	590,073	2,175,636	597,101	284,128	64,693	1,104,683	2,191,113	100.7	—15,477	161,438	—361,151	475,682
	6 mos.	959	8,179,571	4,198,765	14,246,358	3,161,168	2,791,510	484,763	6,366,206	13,692,782	96.1	553,576	1,066,645	—1,403,878	2,768,326
Atchison, Topeka & Santa Fe System	June	13,085	25,189,001	6,279,834	33,908,965	5,309,789	6,502,685	738,460	13,078,530	26,338,750	77.7	7,570,215	4,195,699	3,082,123	6,018,689
	6 mos.	13,085	138,246,594	42,892,946	196,209,591	29,022,569	39,558,976	4,365,125	72,543,049	149,999,346	76.4	46,210,245	26,042,889	20,757,858	30,471,732
Atlanta & West Point	June	93	206,309	85,896	324,365	38,401	47,466	12,015	167,451	286,002	88.2	38,363	*3,987	21,776	29,026
	6 mos.	93	1,183,476	494,626	1,889,102	267,900	332,895	73,708	991,968	1,792,479	94.9	96,623	*63,217	33,838	185,879
Western of Alabama	June	133	190,393	90,605	303,979	41,150	53,539	11,610	137,933	262,878	86.5	41,101	8,533	31,242	35,316
	6 mos.	133	1,180,198	521,726	1,865,045	310,333	370,560	71,111	842,072	1,710,444	91.7	154,601	4,761	155,837	227,973
Atlantic Coast Line	June	5,569	7,240,652	1,830,024	9,701,965	2,630,673	1,589,803	251,262	4,407,282	9,337,018	96.2	364,947	600,000	—572,345	653,388
	6 mos.	5,569	45,867,153	15,277,092	65,473,726	16,329,638	11,240,259	1,529,793	27,501,172	59,524,207	90.9	5,949,519	4,700,000	—939,276	5,392,915
Charleston & Western Carolina	June	343	294,155	9,771	310,783	67,010	60,200	13,355	141,476	290,469	93.5	20,314	20,000	—748	6,339
	6 mos.	343	1,677,573	47,142	1,772,468	454,160	411,863	73,470	786,190	1,771,627	100.0	841	125,000	—138,233	245,558
Baltimore & Ohio	June	6,139	20,333,482	3,001,549	24,607,127	3,299,983	5,395,256	619,496	11,052,333	21,629,631	87.9	2,977,496	1,712,260	980,611	3,759,117
	6 mos.	6,139	111,053,443	19,969,249	139,346,353	21,983,593	35,480,703	3,602,783	64,501,459	133,075,043	95.5	6,271,310	9,685,784	—5,515,899	22,958,343
Staten Island Rapid Transit	June	29	144,244	120,085	274,586	45,824	31,839	1,280	178,606	281,028	102.3	—6,442	35,429	—58,156	115,965
	6 mos.	29	886,757	675,049	1,628,871	314,530	225,411	9,330	915,871	1,604,964	98.5	23,907	216,025	—299,618	553,901
Bangor & Aroostook	June	602	496,185	53,501	572,045	222,796	189,400	7,612	213,168	672,181	117.5	—100,136	5,007	—64,703	29,161
	6 mos.	602	5,574,049	322,628	6,047,836	1,389,598	1,247,310	43,549	1,850,907	4,763,911	78.8	1,283,925	595,288	638,993	690,552
Bessemer & Lake Erie	June	214	1,500,561	1,375	1,514,961	149,859	388,500	16,564	349,236	948,853	62.6	566,108	61,289	710,019	533,455
	6 mos.	214	4,567,477	9,852	4,661,981	859,982	2,402,215	93,221	1,754,377	5,383,083	115.5	—721,102	330,073	364,508	1,463,627
Boston & Maine	June	1,762	3,911,111	1,455,794	5,888,017	1,130,488	1,027,371	99,271	2,680,121	5,219,953	88.7	668,064	450,757	—28,570	832,393
	6 mos.	1,764	25,445,308	8,159,412	36,901,770	6,456,983	6,425,581	607,088	16,776,504	31,941,112	86.6	4,960,658	2,815,412	439,206	3,838,301
Burlington, Rock Island	June	228	216,033	74,511	306,865	45,501	33,429	3,918	126,710	227,115	74.0	79,750	10,374	24,358	93,826
	6 mos.	228	1,103,258	387,745	1,604,501	248,599	187,368	22,966	616,412	1,178,442	73.4	426,059	56,941	125,806	365,741
Cambria & Indiana	June	35	134,696	.....	134,752	13,881	46,604	644	20,566	89,467	66.39	45,285	55,745	68,174	50,187
	6 mos.	35	580,157	.....	580,491	71,140	294,700	4,054	103,544	518,126	89.26	62,365	240,811	256,730	296,700
Canadian Pacific Lines in Maine	June	234	168,248	50,491	249,544	122,692	50,261	8,440	120,229	313,255	125.5	—63,711	20,343	—129,199	36,036
	6 mos.	234	2,368,304	404,285	2,961,003	488,680	454,633	50,449	1,199,433	2,265,665	76.5	695,338	136,948	87,759	826,314
Canadian Pacific Lines in Vermont	June	90	103,805	12,076	130,645	41,680	33,299	3,066	112,794	196,392	150.3	—65,747	11,439	—115,975	—116,566
	6 mos.	90	575,134	98,359	783,685	245,071	209,289	18,315	747,035	1,252,399	159.8	—468,714	64,785	—769,929	—666,017
Central of Georgia	June	1,815	1,926,771	339,784	2,486,518	389,016	398,086	100,249	1,264,981	2,301,557	92.6	184,961	201,549	8,362	554,894
	6 mos.	1,815	11,673,564	2,589,812	15,770,022	2,720,128	2,817,972	549,931	7,795,690	14,823,540	94.0	946,482	1,210,186	—155,097	3,074,985
Central of New Jersey	June	649	2,879,954	553,581	3,643,335	530,294	740,796	66,124	1,847,804	3,373,316	92.6	270,019	368,072	—224,834	698,985
	6 mos.	649	18,111,596	3,207,179	22,780,396	2,994,076	4,705,863	390,206	11,830,717	21,036,718	92.3	1,743,678	2,315,338	—1,495,375	3,421,055
Central Vermont	June	422	507,933	76,000	635,470	99,525	92,832	10,594	321,936	556,349	87.5	79,121	40,844	283	1,234
	6 mos.	422	2,986,469	433,000	3,727,989	637,276	702,226	62,970	2,073,914	3,675,268	98.6	52,721	269,219	—534,908	—42,969
Chesapeake & Ohio	June	3,102	16,120,422	1,116,919	17,902,802	2,032,253	3,006,773	304,421	5,636,631	11,672,704	65.2	6,230,098	2,946,541	3,638,111	2,632,439
	6 mos.	3,087	75,140,871	7,892,875	86,188,429	12,809,547	16,574,938	1,846,577	29,892,553	64,945,108	75.4	21,243,321	11,752,188	12,214,335	16,024,387
Chicago & Eastern Illinois	June	910	1,407,453	385,779	1,954,484	330,822	334,255	76,421	907,104	1,759,052	90.0	195,431	122,500	—55,374	239,139
	6 mos.	910	7,909,419	2,308,542	11,430,032	1,969,136	2,627,511	465,054	5,495,981	11,260,255	98.5	169,777	815,000	—1,402,759	1,513,680
Chicago & Illinois Midland	June	131	578,088	930	602,448	57,290	127,563	34,406	174,301	426,312	70.7	176,136	64,564	105,429	92,279
	6 mos.	131	2,393,802	5,056	2,513,060	271,492	587,529	153,783	884,305	2,071,601	82.4	441,459	232,643	215,560	487,156
Chicago & North Western	June	8,065	8,054,179	3,015,952	12,456,838	2,050,777	2,446,000	261,974	5,326,197	10,698,645	85.9	1,758,193	894,682	753,395	2,086,106
	6 mos.	8,065	48,530,408	17,393,026	74,342,059	12,898,516	15,763,244	1,548,691	33,795,560	67,650,055	91.0	6,692,004	5,385,017	—78,532	11,145,437
Chicago, Burlington & Quincy	June	8,868	10,287,010	2,283,371	14,093,760	2,701,049	1,848,946	354,351	5,314,180	10,796,735	76.6	3,297,025	1,718,174	1,347,716	2,373,952
	6 mos.	8,864	70,033,457	15,323,392	95,044,231	14,744,895	13,176,650	20,168,896	33,555,533	67,201,458	70.7	27,842,773	12,899,692	12,959,545	16,342,451
Chicago Great Western	June	1,500	1,494,824	161,327	1,858,308	355,395	311,221	73,695	950,447	1,772,541	95.4	85,767	85,878	—160,751	235,989
	6 mos.	1,500	10,421,274	1,181,681	12,899,523	2,483,371	2,039,262	446,994	6,379,733	11,829,774	91.7	1,069,749	746,960	—807,994	1,457,198
Chicago, Indianapolis & Louisville	June	541	718,171	34,936	796,924	155,022	167,195	35,269	365,743	778,744	97.7	18,180	67,105	—117,722	107,513
	6 mos.	541	4,256,610	247,743	4,769,070	731,182	1,041,244	214,935	2,184,945	4,472,550	93.8	296,520	359,658	—482,830	1,150,280

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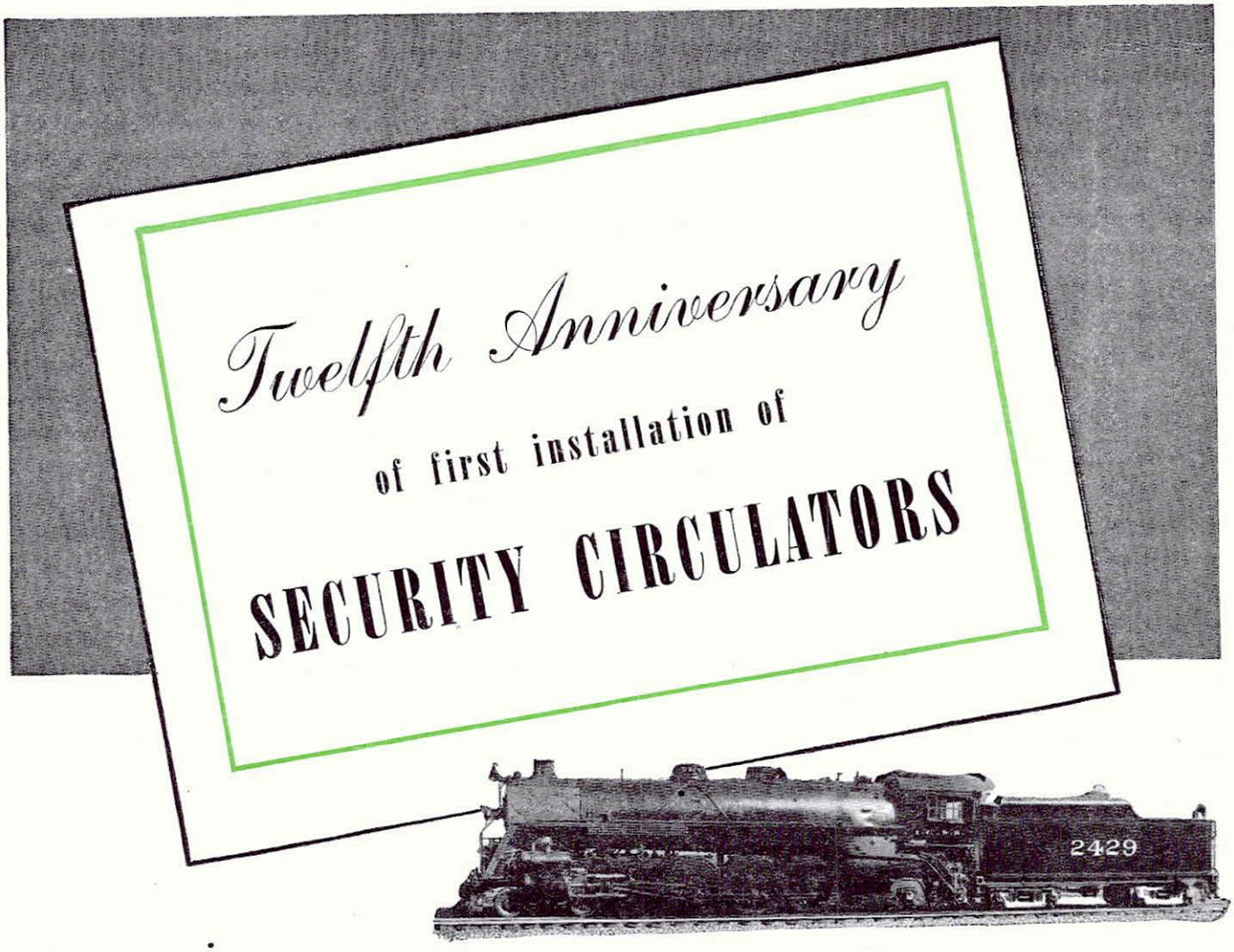


TWELVE years ago the first installation of Security Circulators was made on a locomotive of the Illinois Central, No. 2429 being equipped with four circulators.

Since that time, every year has seen a continually widening recognition of the many advantages of Security Circulators for improving locomotive performance. Today, more than 6600 Security Circulators have been ordered by forty-five different railroads.

AMERICAN ARCH COMPANY, INC.

NEW YORK • CHICAGO

SECURITY CIRCULATOR DIVISION

REVENUES AND EXPENSES OF RAILWAYS

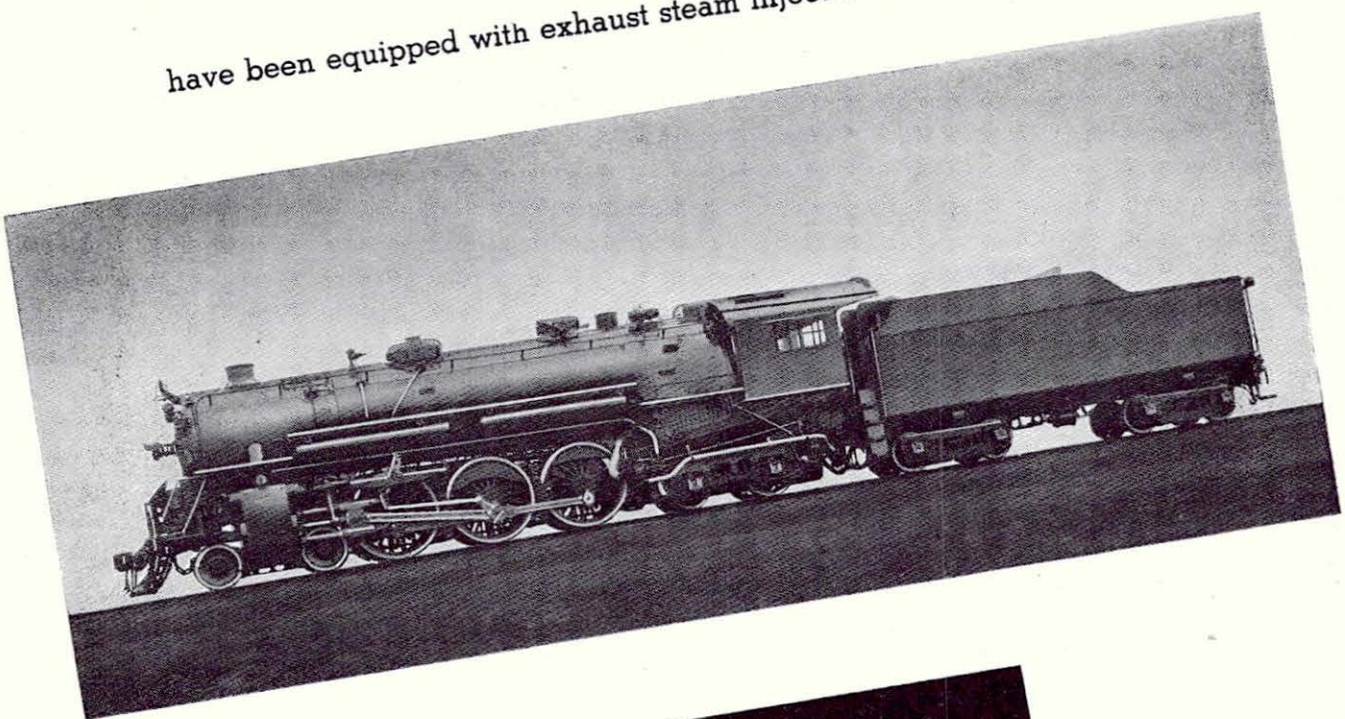
Month of June and Six Months of Calendar Year 1946.

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Railway tax accruals	Net railway operating income 1946	Net railway operating income 1945
Chicago, Milwaukee, St. Paul & Pacific	June	10,733	$11,195,205	$2,507,321	$15,481,460	$3,456,954	$3,091,470	$339,728	$6,961,797	$14,674,824	94.8	$806,636	$1,210,000	—$740,419	$2,492,893
	6 mos.	10,733	68,477,953	15,099,629	93,474,723	16,984,485	18,898,927	1,929,083	43,448,850	86,162,189	92.2	7,312,534	2,403,000	2,367,222	14,684,924
Chicago, Rock Island & Pacific	June	7,651	9,608,543	2,475,147	13,131,193	1,936,854	2,093,862	401,570	5,077,329	10,179,547	77.5	2,951,646	1,038,705	1,390,621	2,377,362
	6 mos.	7,652	54,032,200	15,695,956	76,040,226	10,454,018	13,237,309	2,332,556	30,224,627	60,288,012	79.3	15,752,214	5,169,180	6,663,501	14,013,433
Chicago, St. Paul, Minneapolis & Omaha	June	1,616	1,522,172	297,281	2,073,234	308,100	393,431	51,079	1,025,380	1,884,357	90.9	188,877	162,363	—82,896	268,772
	6 mos.	1,616	9,606,891	1,592,312	12,519,919	2,268,289	2,410,449	287,542	6,743,665	12,292,948	98.2	226,971	959,548	—1,538,347	1,693,343
Clinchfield	June	302	1,034,682	9,638	1,054,138	94,781	177,615	22,458	334,545	651,227	61.8	402,911	137,483	314,150	527,195
	6 mos.	302	5,916,446	47,702	6,024,554	651,685	1,022,043	154,405	1,732,799	3,709,610	61.6	2,314,944	824,265	1,677,434	3,031,231
Colorado & Southern	June	748	600,069	160,742	845,053	154,558	127,261	20,254	342,069	691,010	81.8	154,043	66,681	85,625	225,948
	6 mos.	748	3,471,308	1,079,794	5,081,493	995,289	986,567	123,786	2,193,197	4,595,669	90.4	485,824	407,711	13,994	1,251,880
Fort Worth & Denver City	June	902	858,105	214,028	1,171,610	207,363	149,764	32,112	414,546	867,396	74.0	304,214	54,219	204,107	—111,959
	6 mos.	902	3,615,973	1,468,623	5,652,909	1,334,108	968,917	190,216	2,122,358	4,998,569	88.4	654,340	348,723	162,148	729,267
Colorado & Wyoming	June	42	95,134	.....	146,453	8,355	12,923	874	52,745	80,865	55.2	65,588	16,239	49,675	14,550
	6 mos.	42	342,795	.....	579,674	51,410	80,491	4,788	236,504	408,416	70.4	171,258	24,326	134,725	115,999
Columbus & Greenville	June	168	114,328	4,404	126,402	31,950	18,380	4,694	49,823	119,467	94.5	6,935	9,747	—3,160	11,061
	6 mos.	168	731,339	34,573	817,033	178,810	126,569	29,874	299,465	722,899	88.5	94,134	71,895	22,063	52,734
Delaware & Hudson	June	846	2,959,397	138,402	3,182,320	522,590	553,395	60,720	1,421,238	2,690,030	84.5	492,290	215,709	327,614	471,569
	6 mos.	846	18,833,434	857,319	20,237,469	3,056,621	4,863,990	338,092	8,854,717	17,939,167	88.6	2,298,302	1,357,618	1,050,661	2,607,345
Delaware, Lackawanna & Western	June	973	3,997,382	883,775	5,400,432	872,590	1,023,412	127,272	2,790,991	5,017,530	92.9	382,902	285,255	59,495	—723,319
	6 mos.	973	24,452,708	5,101,840	32,586,885	4,117,839	5,933,508	747,847	16,697,250	28,740,101	88.2	3,846,784	2,160,074	1,489,607	2,006,763
Denver & Rio Grande Western	June	2,386	3,177,756	551,235	3,953,430	601,999	930,043	121,441	1,534,030	3,391,371	85.8	562,059	316,552	245,753	1,542,167
	6 mos.	2,386	17,904,366	4,781,397	24,032,647	3,237,112	5,949,896	700,244	9,885,386	21,071,411	87.7	2,961,236	1,839,562	1,047,644	7,116,615
Denver & Salt Lake	June	232	265,220	6,494	283,511	68,219	47,376	4,059	100,196	232,852	82.1	50,659	32,161	61,193	65,006
	6 mos.	232	1,412,767	42,089	1,520,119	322,773	332,425	23,739	610,266	1,369,354	90.1	150,765	193,728	222,892	420,839
Detroit & Mackinac	June	230	92,633	2,497	100,849	30,588	12,733	837	37,974	87,358	86.6	13,491	5,456	—259	2,164
	6 mos.	230	534,070	23,194	595,517	136,158	88,504	4,573	224,915	484,803	81.4	110,714	29,737	36,762	1,310
Detroit & Toledo Shore Line	June	50	331,688	.....	333,009	33,968	27,749	11,135	114,669	196,810	59.1	136,199	36,624	37,291	49,179
	6 mos.	50	1,956,344	.....	1,964,565	201,679	177,291	62,231	689,588	1,186,873	60.4	777,692	232,915	190,604	347,470
Detroit, Toledo & Ironton	June	464	535,738	1,178	570,882	88,793	145,626	16,880	199,857	477,557	83.7	93,325	6,873	79,078	89,098
	6 mos.	464	4,245,696	6,486	4,474,141	628,545	943,702	104,266	1,415,672	3,260,887	72.9	1,213,254	387,016	613,016	1,114,145
Duluth, Missabe & Iron Range	June	546	3,758,515	3,435	4,388,755	476,846	391,743	6,763	923,027	1,846,420	42.1	2,542,335	329,166	2,216,650	1,888,950
	6 mos.	546	7,721,219	21,359	8,994,877	2,196,458	2,226,781	37,019	3,025,285	7,778,386	86.5	1,216,491	796,813	410,498	3,309,177
Duluth, Winnipeg & Pacific	June	175	168,000	1,700	173,600	61,434	31,927	2,691	83,775	184,185	106.1	—10,585	16,227	—46,292	16,188
	6 mos.	175	1,246,000	9,700	1,282,100	299,814	205,553	16,008	594,156	1,143,147	89.2	138,953	108,579	—137,025	29,852
Elgin, Joliet & Eastern	June	392	1,620,692	13	2,016,511	285,773	414,595	20,691	977,381	1,771,334	87.8	245,177	149,615	44,848	76,455
	6 mos.	392	9,271,306	163	11,113,857	1,613,033	2,482,019	120,279	5,468,361	10,147,598	91.3	966,259	900,108	—568,341	2,248,001
Erie	June	2,242	8,271,357	829,816	9,688,247	1,332,040	2,178,387	238,236	5,495,748	9,796,452	101.1	—108,205	569,829	—1,104,425	1,775,434
	6 mos.	2,242	49,264,909	4,951,942	58,007,400	6,498,293	12,104,512	1,496,930	29,543,851	52,958,113	91.3	5,049,287	3,395,731	—1,512,825	8,616,139
Florida East Coast	June	682	979,819	539,165	1,649,491	307,595	363,110	57,486	819,938	1,697,295	102.9	—47,804	*104,359	—24,863	357,922
	6 mos.	682	8,990,493	4,471,898	14,632,281	1,918,321	2,133,638	340,086	5,259,441	10,533,594	72.0	4,098,687	1,051,329	2,338,367	3,075,571
Georgia Railroad	June	328	537,870	86,182	661,111	91,008	105,236	25,132	339,057	585,561	88.6	75,550	37,354	44,900	184,703
	6 mos.	328	3,039,782	521,859	3,789,011	565,796	748,055	153,254	1,945,225	3,569,855	94.2	219,156	226,587	38,071	1,037,631
Georgia & Florida	June	408	175,031	2,868	182,752	46,884	27,066	11,600	81,311	174,580	95.5	8,172	11,830	—13,636	15,495
	6 mos.	408	1,100,077	18,086	1,148,367	318,789	162,168	69,019	461,649	1,058,566	92.2	89,801	72,202	—58,447	43,315
Grand Trunk Western	June	972	2,409,000	322,000	2,900,000	522,928	505,117	44,801	1,529,594	2,721,720	93.9	178,280	182,653	—162,611	338,683
	6 mos.	1008	12,918,000	1,508,000	15,449,000	3,076,614	3,349,142	265,567	8,455,424	15,874,945	102.8	—425,945	741,457	—1,611,219	2,465,733
Canadian National Lines in New England	June	172	140,500	13,000	165,600	59,121	31,675	2,255	81,616	182,603	110.3	—17,003	21,716	—66,820	—25,833
	6 mos.	172	856,100	57,700	1,069,700	322,744	240,446	13,694	660,241	1,340,146	125.3	—270,446	130,296	—626,829	—410,033
Great Northern	June	8,332	11,356,112	1,319,585	14,017,296	2,442,224	2,150,794	337,609	4,607,500	10,061,171	71.8	3,956,125	1,133,974	2,736,113	3,025,566
	6 mos.	8,332	59,620,124	8,488,807	74,303,334	15,243,934	14,686,661	1,701,699	28,241,619	62,895,150	84.6	11,408,184	6,853,533	4,025,564	11,175,166
Green Bay & Western	June	234	189,507	476	194,928	52,103	17,171	10,216	72,637	162,463	83.3	32,465	20,529	7,253	5,332
	6 mos.	234	1,248,399	2,266	1,281,833	303,340	136,984	67,030	517,920	1,093,315	85.2	188,518	150,553	—14,580	52,463

Table continued on next left-hand page

Sustained Boiler Capacity from Old Locomotives ...with *Elesco* Exhaust Steam Injectors

More than 30,000 locomotives throughout the World have been equipped with exhaust steam injectors.



THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, INC.
60 East 42nd Street, NEW YORK
122 S. Michigan Ave., CHICAGO
Montreal, Canada, THE SUPERHEATER COMPANY, LTD.

ELESCO

A-1808 (2474)

Superheaters • Superheater Pyrometers • Exhaust Steam Injectors • Steam Dryers • Feedwater Heaters • American Throttles

REVENUES AND EXPENSES OF RAILWAYS

Month of June and Six Months of Calendar Year 1946.

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Railway tax accruals	Net railway operating income 1946	Net railway operating income 1945
Gulf, Mobile & Ohio	June	1,945	$2,498,087	$139,755	$2,726,941	$562,133	$522,579	$114,118	$936,495	$2,276,407	83.5	$450,534	$172,903	$123,867	$341,212
	6 mos.	1,945	15,523,536	971,177	17,082,863	3,421,203	3,294,012	611,352	6,292,976	14,498,122	84.9	2,584,741	1,160,363	419,656	2,250,063
Illinois Central	June	5,077	10,931,942	2,257,706	14,160,967	2,988,715	2,873,559	287,849	5,678,401	12,598,313	89.0	1,562,654	1,006,826	442,235	2,689,014
	6 mos.	5,080	66,236,844	14,971,088	87,572,845	15,214,097	16,018,763	1,662,753	34,177,453	71,991,740	82.2	15,581,105	8,413,592	6,335,054	13,634,807
Yazoo & Mississippi Valley	June	1,524	2,170,863	165,519	2,440,155	350,925	279,184	42,648	879,929	1,634,809	67.0	805,346	271,956	459,876	—243,366
	6 mos.	1,524	10,708,591	1,703,332	13,068,147	2,676,694	1,589,343	251,070	5,325,241	10,392,674	79.5	2,675,473	1,324,705	918,226	2,080,179
Illinois Central System	June	6,601	13,102,805	2,423,225	16,601,122	3,339,640	3,152,743	330,497	6,558,330	14,233,122	85.7	2,368,000	1,286,698	911,121	2,452,561
	6 mos.	6,604	76,945,435	16,674,420	100,640,992	17,890,791	17,608,106	1,913,823	39,502,694	82,384,414	81.9	18,256,578	9,769,555	7,284,354	15,748,463
Illinois Terminal	June	476	537,985	143,592	759,413	107,514	105,418	24,411	302,691	574,232	75.62	185,181	83,829	76,046	117,795
	6 mos.	476	3,080,448	852,994	4,351,355	694,303	652,849	140,646	1,809,594	3,481,177	80.00	870,178	426,129	319,002	724,777
Kansas City Southern	June	890	2,129,787	239,165	2,550,840	286,711	349,494	61,480	911,572	1,710,796	67.1	840,044	310,000	403,703	530,096
	6 mos.	890	11,695,227	1,433,265	14,251,320	1,493,536	2,062,844	420,295	4,869,506	9,543,557	67.0	4,707,763	1,573,000	2,401,786	3,107,041
Kansas, Oklahoma & Gulf	June	328	335,529	1,526	339,695	35,150	25,061	13,075	91,180	178,356	52.5	161,339	54,881	81,853	127,385
	6 mos.	328	1,835,307	9,046	1,864,297	244,733	151,109	77,958	522,175	1,077,585	57.8	786,712	282,374	353,323	535,752
Lake Superior & Ishpeming	June	156	268,982	88	323,705	53,066	31,792	633	70,651	164,269	50.7	159,436	24,421	138,277	121,643
	6 mos.	156	502,249	512	581,156	237,759	246,727	4,409	234,435	773,887	133.2	—192,731	138,550	—299,365	211,461
Lehigh & Hudson River	June	96	197,421	.....	197,705	44,297	32,474	6,364	77,970	167,814	84.9	29,891	16,182	1,066	21,583
	6 mos.	96	1,260,512	.....	1,263,917	226,968	197,321	37,241	448,846	955,282	75.6	308,635	140,843	84,116	150,285
Lehigh & New England	June	190	465,498	.....	472,241	63,168	96,763	10,234	189,871	381,922	80.9	90,319	51,642	51,895	125,062
	6 mos.	190	2,979,944	.....	3,008,563	381,867	592,166	59,832	1,109,980	2,279,511	75.8	729,052	377,096	445,732	414,820
Lehigh Valley	June	1,254	4,270,520	491,846	5,096,809	777,829	776,219	130,294	2,491,554	4,403,910	86.4	692,899	405,996	181,825	—40,663
	6 mos.	1,254	25,623,247	3,462,144	31,389,737	4,147,137	4,466,432	779,436	15,651,574	26,423,863	84.2	4,965,874	2,505,220	1,408,424	1,924,112
Louisiana & Arkansas	June	756	921,508	96,013	1,058,952	138,820	127,833	36,228	369,318	713,322	67.4	345,630	112,982	174,138	252,868
	6 mos.	756	5,544,735	617,550	6,406,237	842,342	905,323	225,495	2,152,944	4,399,911	68.7	2,006,326	680,014	924,723	1,370,002
Louisville & Nashville	June	4,759	10,573,589	2,077,266	13,615,108	1,974,583	2,928,715	258,125	6,089,084	11,814,853	86.8	1,800,255	1,233,165	923,925	2,104,553
	6 mos.	4,758	61,719,465	13,067,588	80,058,320	11,751,122	17,603,558	1,534,226	34,164,458	68,470,594	85.5	11,587,726	7,872,107	5,755,824	12,698,367
Maine Central	June	988	1,073,129	273,328	1,440,607	290,679	290,453	16,583	673,730	1,329,118	92.3	111,489	24,895	—59,373	116,808
	6 mos.	988	8,402,807	1,256,651	10,246,573	1,802,940	1,891,154	95,862	4,459,205	8,593,335	83.9	1,653,238	666,193	524,667	956,299
Midland Valley	June	334	130,290	24	133,803	30,195	14,127	3,320	47,863	102,071	76.3	31,732	11,751	15,661	17,340
	6 mos.	334	751,192	139	764,435	163,521	91,717	17,958	296,035	606,295	79.3	158,140	68,556	42,033	133,165
Minneapolis & St. Louis	June	1,408	852,599	22,755	927,146	282,423	186,224	87,321	431,286	1,068,135	115.2	—140,989	—162,876	48,663	78,553
	6 mos.	1,408	6,028,783	203,602	6,541,959	1,631,832	1,218,470	514,457	2,748,538	6,555,774	100.2	—13,815	205,743	—325,583	844,467
Minneapolis, St. Paul & Sault Ste. Marie	June	3,224	2,158,232	137,778	2,473,313	489,353	341,269	47,377	1,015,451	1,973,139	79.8	500,174	178,223	295,636	428,704
	6 mos.	3,224	10,497,230	764,563	12,191,839	2,742,928	2,412,196	276,268	6,022,561	11,951,969	98.0	239,870	1,004,525	—712,686	951,414
Duluth, South Shore & Atlantic	June	530	249,461	13,158	291,336	89,756	61,974	14,632	143,619	320,300	109.9	—28,964	20,926	—60,894	84,045
	6 mos.	530	1,728,713	77,838	1,932,986	412,549	391,359	79,000	906,946	1,844,484	95.4	88,502	124,506	—97,629	308,272
Spokane International	June	152	115,420	3,554	126,527	31,687	13,461	3,152	44,206	99,377	78.5	27,149	9,493	9,767	25,924
	6 mos.	152	636,492	17,652	698,223	178,425	98,806	18,712	261,412	599,089	85.8	99,134	*4,840	60,284	141,662
Mississippi Central	June	158	130,140	2,184	135,079	26,747	15,038	9,713	35,968	94,221	69.8	40,858	9,910	17,722	31,099
	6 mos.	158	735,072	32,735	788,607	181,924	97,921	58,007	223,605	604,948	76.7	183,659	46,352	59,996	148,405
Missouri & Arkansas	June	365	133,458	2,251	145,342	36,290	21,074	7,457	63,023	134,007	92.2	11,335	6,092	—12,392	—83,163
	6 mos.	365	838,237	12,068	908,321	254,439	139,547	44,775	383,601	860,048	94.7	48,273	36,752	—88,906	—208,719
Missouri-Illinois	June	172	276,179	419	278,852	51,299	34,147	4,662	83,468	180,902	64.9	97,950	45,407	46,138	35,689
	6 mos.	172	1,569,868	2,503	1,584,107	259,449	202,002	29,217	476,038	1,008,670	63.7	575,437	266,570	272,293	221,744
Missouri-Kansas-Texas Lines	June	3,253	4,185,936	663,626	5,292,092	766,957	803,424	183,563	2,121,233	4,127,170	78.0	1,164,922	468,619	433,492	511,700
	6 mos.	3,253	22,983,444	4,185,421	29,898,566	4,878,266	4,232,991	1,185,258	11,913,123	23,814,450	79.7	6,084,116	2,583,116	2,251,262	3,752,195
Missouri Pacific	June	7,080	10,726,125	1,570,389	13,470,942	2,110,237	2,594,546	342,421	5,533,095	11,139,214	82.7	2,331,728	824,972	901,327	2,252,043
	6 mos.	7,080	63,988,182	10,558,189	81,685,694	12,027,862	15,354,092	2,073,437	33,111,354	66,131,697	80.9	15,553,997	5,099,422	6,882,105	16,399,207
Gulf Coast Lines	June	1,734	2,520,423	157,550	2,822,062	625,968	372,848	65,399	1,029,954	2,190,700	77.63	631,362	124,797	240,398	344,731
	6 mos.	1,734	18,675,478	1,259,877	20,783,706	3,506,990	2,126,521	389,957	6,239,243	12,830,265	61.73	7,953,441	1,939,670	4,162,776	3,432,751
International-Great Northern	June	1,110	1,785,428	320,375	2,352,172	477,280	365,577	36,422	1,060,710	2,044,730	86.9	307,442	101,928	25,596	311,935
	6 mos.	1,110	9,823,985	1,904,179	13,170,159	2,847,114	2,103,941	251,593	5,557,571	11,410,670	86.6	1,759,489	631,012	87,027	1,836,748
Monongahela	June	170	522,360	2,540	527,521	63,568	54,282	797	156,413	278,829	52.9	248,692	33,173	126,794	141,761
	6 mos.	170	2,615,203	11,428	2,644,944	375,047	278,997	4,440	867,888	1,552,656	58.7	1,092,288	200,344	433,051	538,479

Table continued on next left-hand page

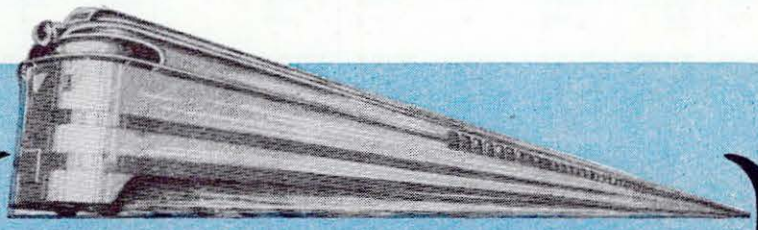
IN THE ATOMIC AGE

AS NOW SAFETY SPEED COMFORT

WILL STILL BE THE MAJOR CONSIDERATIONS

These are the impelling factors in rail travel today and, regardless of the motive power of the future, they're likely to remain so. High speed travel attains new levels in comfort and safety under the control of the modern, electro-pneumatic "HSC" precision brake. Coupled with the traditional safety of air control, are Electro-pneumatic transmission, Speed Governor Control, and "Decelostat" Anti-Wheel Sliding Protection—maximum protection for passengers and equipment.

Most of ordering railroads now specify electro-pneumatic "HSC" brake and many others are including it in their new equipment plans. Where no final conclusions as to future needs are possible it is a good idea to specify "HSC"—it is the answer to the ever-increasing urge to improve schedules.



SAFETY
SPEED
COMFORT

For maximum utilization of passenger car equipment specify the complete "HSC" control.

- **Electro-pneumatic**—improves schedules with flexibility and smoothness
- **Speed Governor Control**—for control of high braking forces
- **"AP" Decelostat**—for anti-wheel sliding protection

Westinghouse Air Brake Company

Wilmerding, Pa.

REVENUES AND EXPENSES OF RAILWAYS

Month of June and Six Months of Calendar Year 1946.

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Railway tax accruals	Net railway operating income 1946	1945
Montour	June	51	$254,831	.....	$256,245	$23,621	$61,480	$1,126	$83,891	$180,516	70.5	$75,729	$41,770	$46,170	$86,795
	6 mos.	51	1,068,125	.....	1,074,366	129,841	369,183	8,314	418,619	980,541	91.3	93,825	148,445	136,181	340,666
Nashville, Chattanooga & St. Louis	June	1,053	1,882,607	$254,898	2,344,246	474,466	510,481	84,801	1,039,858	2,193,659	93.6	150,587	139,710	13,117	183,962
	6 mos.	1,053	10,894,981	2,198,175	14,391,296	3,031,728	3,198,038	576,860	6,468,387	13,837,255	96.2	554,041	977,185	—457,574	2,434,076
New York Central	June	10,746	31,093,974	14,212,813	50,946,105	6,113,726	10,220,963	835,630	23,026,044	42,773,876	84.0	8,172,229	3,552,071	3,369,188	6,309,782
	6 mos.	10,746	185,006,155	74,248,605	287,608,939	41,343,896	62,168,400	5,226,794	138,567,550	263,101,403	91.5	24,507,536	12,554,121	3,277,524	28,771,383
Pittsburgh & Lake Erie	June	229	2,183,240	102,580	2,386,304	334,365	789,361	53,578	1,027,324	2,337,025	97.9	49,279	160,762	411,644	530,811
	6 mos.	229	10,431,533	552,627	11,490,837	2,046,604	4,776,019	314,486	5,787,759	13,709,074	119.3	—2,218,237	394,828	1,024,307	2,488,747
New York, Chicago & St. Louis	June	1,687	5,271,584	229,263	5,616,101	872,592	962,744	178,367	2,407,571	4,653,239	82.9	962,862	332,956	343,644	1,884,604
	6 mos.	1,687	31,303,752	1,586,791	33,618,595	5,062,364	5,994,500	1,038,137	14,505,514	27,989,444	83.3	5,629,151	2,152,384	1,792,510	9,468,173
New York, New Haven & Hartford	June	1,843	5,898,203	5,364,995	12,150,741	1,929,448	1,829,129	225,575	5,402,743	10,275,656	84.6	1,875,085	364,000	349,426	1,753,647
	6 mos.	1,840	35,721,970	30,486,370	72,003,048	11,397,203	11,551,511	1,265,080	32,659,028	62,042,211	86.2	9,960,837	4,667,500	—1,241,707	9,763,713
New York Connecting	June	21	167,751	.....	165,082	68,824	12,873	.....	58,274	142,450	86.3	22,632	56,754	61,994	184,854
	6 mos.	21	1,032,890	.....	1,049,504	326,809	96,421	.....	359,507	794,261	75.7	255,243	358,974	507,830	932,682
New York, Ontario & Western	June	547	460,054	25,906	550,823	99,379	118,104	25,563	340,031	609,620	110.7	—58,797	40,394	—165,279	51,945
	6 mos.	547	2,859,421	44,059	3,341,341	533,689	657,714	153,023	1,955,154	3,474,485	104.0	—133,144	234,429	—780,591	—745,659
New York, Susquehanna & Western	June	120	288,764	37,122	335,307	37,626	42,912	5,038	148,081	254,393	75.9	80,914	38,016	—9,280	67,746
	6 mos.	120	1,687,282	241,485	2,002,336	196,626	218,763	29,299	897,165	1,450,663	72.4	551,673	231,564	7,386	345,368
Norfolk & Western	June	2,161	10,330,399	950,669	11,599,598	1,362,543	2,084,655	195,870	3,386,468	7,418,866	64.0	4,180,732	2,307,627	2,423,869	2,053,341
	6 mos.	2,161	51,608,006	6,126,222	59,579,815	8,519,941	13,042,165	1,205,536	19,251,740	44,334,105	74.4	15,245,710	10,354,482	9,375,256	12,778,659
Norfolk Southern	June	727	748,875	11,187	781,059	171,180	90,392	35,421	295,344	627,884	80.4	153,175	42,118	69,208	103,110
	6 mos.	727	3,651,743	80,566	3,857,600	1,001,720	496,784	206,775	1,541,962	3,454,664	86.6	402,936	243,495	—65,360	330,450
Northern Pacific	June	6,872	7,416,986	1,179,887	9,588,850	2,125,077	2,071,859	232,442	3,802,394	8,828,656	92.1	760,194	891,631	245,711	2,000,046
	6 mos.	6,872	44,194,011	8,500,803	58,373,536	11,406,942	12,498,622	1,284,943	23,847,191	52,724,320	90.3	5,649,216	5,412,882	2,589,231	9,852,152
Northwestern Pacific	June	331	347,218	7,622	378,897	136,029	56,309	5,524	196,462	403,619	106.5	—24,722	25,549	—75,102	105,063
	6 mos.	331	1,837,248	40,780	2,001,858	956,800	374,920	21,507	1,132,436	2,539,384	126.9	—537,526	164,431	—836,690	328,122
Oklahoma City-Ada-Atoka	June	132	62,843	22	64,606	20,223	7,568	1,336	23,204	56,425	87.3	8,181	2,712	5,929	5,236
	6 mos.	132	472,988	23	490,994	125,283	26,752	7,816	143,209	326,879	66.6	164,115	49,432	39,535	98,086
Pennsylvania	June	10,121	42,949,138	17,371,852	65,132,496	8,511,766	15,664,188	1,399,651	33,065,215	61,686,831	94.7	3,445,665	3,613,605	—948,033	13,405,495
	6 mos.	10,121	238,587,913	108,511,015	377,229,861	47,907,189	92,204,434	7,906,023	192,344,001	359,286,841	95.2	17,943,020	22,536,594	—7,710,129	66,021,175
Long Island	June	376	897,267	2,861,688	3,910,527	430,558	524,924	26,435	1,942,544	2,993,695	76.6	916,832	419,951	184,103	723,238
	6 mos.	376	6,191,363	13,765,123	21,073,870	2,535,528	3,218,867	107,791	11,292,983	17,612,946	83.6	3,460,924	2,557,372	—805,320	768,113
Pennsylvania-Reading Seashore Lines	June	390	401,282	567,747	1,000,382	168,739	99,893	11,142	583,981	887,746	88.7	112,636	72,829	—107,072	162,264
	6 mos.	390	2,403,427	1,878,979	4,445,888	1,013,070	636,167	51,254	2,936,505	4,793,056	107.8	—347,168	426,870	—1,434,916	—510,250
Pere Marquette	June	1,949	3,341,490	216,878	3,836,193	635,039	709,847	103,356	1,676,617	3,359,139	87.6	477,054	266,177	54,544	573,027
	6 mos.	1,949	19,772,547	1,135,795	22,131,828	3,695,658	4,666,081	581,417	10,173,044	20,354,887	92.0	1,776,941	1,524,534	—371,251	3,969,629
Pittsburg & Shawmut	June	97	174,324	.....	175,169	37,883	27,598	2,927	53,469	129,350	73.8	45,819	5,389	30,172	38,158
	6 mos.	97	708,553	.....	713,895	148,903	149,954	14,845	232,614	585,413	82.0	128,482	27,094	71,704	142,948
Pittsburgh & West Virginia	June	136	366,224	43	385,877	80,774	90,982	27,954	120,080	347,528	90.1	38,349	27,720	35,093	165,646
	6 mos.	136	1,914,375	43	2,029,190	415,064	505,113	165,127	710,532	1,970,459	97.1	58,731	163,942	54,038	1,202,827
Pittsburg, Shawmut & Northern	June	122	66,641	.....	67,667	14,043	10,793	1,148	28,225	60,780	89.8	6,887	4,927	—9,499	—7,182
	6 mos.	179	411,066	.....	415,586	98,233	82,636	6,461	211,623	435,824	104.9	—20,238	32,708	—106,328	—44,670
Reading	June	1,362	6,473,163	714,456	7,534,509	1,203,041	1,743,931	107,964	3,357,729	6,658,632	88.4	875,877	520,981	347,060	1,472,326
	6 mos.	1,362	39,966,850	5,511,855	47,809,098	7,928,694	10,165,501	616,466	21,224,839	41,422,681	86.6	6,386,417	3,790,256	2,325,400	7,080,569
Richmond, Fredericksburg & Potomac	June	118	1,253,231	707,123	2,079,213	247,819	281,844	16,338	798,534	1,449,895	69.7	629,318	412,048	113,821	220,068
	6 mos.	118	7,116,910	5,401,926	13,500,937	1,731,712	1,788,866	102,318	5,028,978	9,318,748	69.0	4,182,189	1,953,732	1,475,004	1,182,906
Rutland	June	407	265,600	37,135	371,293	69,988	77,059	13,382	222,162	397,241	107.0	—25,948	25,512	—60,733	65,614
	6 mos.	407	1,762,860	258,229	2,409,531	402,542	508,927	76,697	1,378,209	2,459,599	102.1	—50,068	158,826	—257,381	—101,551
St. Louis-San Francisco	June	4,645	5,763,949	992,332	7,362,010	1,142,587	1,492,703	205,679	3,138,778	6,351,181	86.3	1,010,829	509,278	594,717	1,434,051
	6 mos.	4,645	32,803,359	7,222,355	43,789,264	8,469,211	10,169,971	1,186,555	19,593,300	41,716,282	95.3	2,072,982	3,208,543	—696,729	8,851,197
St. Louis, San Francisco & Texas	June	160	258,164	36,190	306,605	43,760	42,931	15,749	151,817	262,638	85.7	43,967	14,850	2,587	38,652
	6 mos.	160	1,533,910	144,977	1,742,366	271,274	234,517	77,688	793,014	1,426,173	81.9	316,193	81,213	71,360	205,257

* Cr.

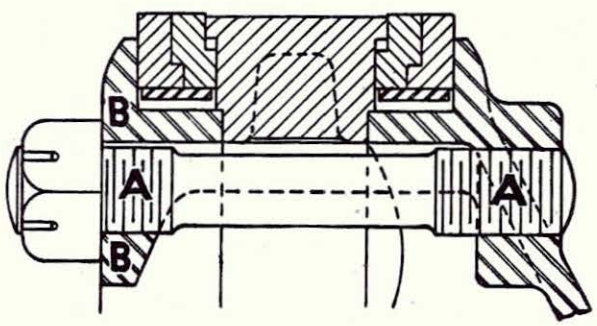
Table continued on next left-hand page

Lightness
IS ONLY ONE ADVANTAGE

Packing and Bull Ring Replacement is easier and faster with HUNT-SPILLER LIGHT WEIGHT VALVES

MECHANICAL OFFICERS have many reasons for choosing Hunt-Spiller Light Weight Valves. One is the reduction in weight and frictional wear on valve bushings and valve motion parts. Another reason which looms important is the ease and speed of packing ring replacement. With the followers removed, packing and bull rings are freed, but the valve remains intact.

Specify Hunt-Spiller Light Weight Steel Valves for replacement or on new power Ask your Hunt-Spiller representative for complete particulars.



Cross section of valve packing and bull rings showing butt-welded stud bolt (A) and follower ring (B).

HUNT-SPILLER MFG. CORPORATION
383 Dorchester Ave. Boston 27, Mass.

HUNT-SPILLER

LIGHT WEIGHT
STEEL PISTONS AND VALVES
DUPLEX SECTIONAL PACKING
AIR FURNACE GUN IRON

REVENUES AND EXPENSES OF RAILWAYS

Month of June and Six Months of Calendar Year 1946.

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Railway tax accruals	Net railway operating income 1946	Net railway operating income 1945
St. Louis Southwestern Lines	June	1,575	$3,441,289	$162,883	$3,738,273	$526,061	$571,740	$121,788	$1,346,043	$2,712,785	72.6	$1,025,488	$334,784	$531,862	$882,523
	6 mos.	1,575	20,195,400	960,085	21,978,755	3,938,833	3,598,570	716,196	7,378,993	16,533,829	75.2	5,444,926	1,814,381	2,737,682	5,686,331
Seaboard Air Line	June	4,150	7,004,037	1,489,570	9,037,627	1,519,160	1,504,688	272,517	3,856,304	7,597,913	84.1	1,439,714	202,143	941,851	1,478,645
	6 mos.	4,150	42,719,575	12,328,137	58,892,517	9,615,138	9,912,938	1,643,708	23,252,085	47,303,510	80.3	11,589,007	3,213,616	5,918,814	9,714,346
Southern Railway	June	6,484	13,208,504	2,579,886	16,807,301	2,799,837	3,212,316	305,989	7,283,593	14,293,201	85.0	2,514,100	1,114,883	1,002,549	2,292,311
	6 mos.	6,484	77,157,838	19,189,151	103,380,292	17,200,831	19,248,003	1,853,809	41,868,638	84,521,705	81.8	18,858,587	8,489,598	8,035,357	16,412,480
Alabama Great Southern	June	315	894,105	200,819	1,165,717	208,412	271,614	29,572	452,640	1,012,374	86.9	153,343	124,120	37,758	96,408
	6 mos.	315	5,035,861	1,469,947	6,955,470	1,265,347	1,686,799	156,171	2,738,213	6,182,855	88.9	772,615	557,434	142,821	877,013
Cincinnati, New Orleans & Texas Pacific	June	337	2,043,359	284,073	2,458,035	281,930	592,578	41,542	924,585	1,931,659	78.6	526,376	282,641	290,130	368,383
	6 mos.	337	10,889,463	2,110,858	13,863,359	1,845,449	3,292,300	244,870	5,028,967	10,977,811	79.2	2,885,548	1,561,818	1,587,071	2,289,205
Georgia Southern & Florida	June	397	310,999	76,272	421,030	91,423	69,385	6,602	212,894	394,420	93.7	26,610	*5,565	5,049	71,731
	6 mos.	397	1,947,713	629,043	2,838,541	560,962	425,367	36,576	1,204,405	2,322,346	81.8	516,195	165,350	159,981	413,387
New Orleans & Northeastern	June	204	490,357	95,371	623,438	141,448	83,425	15,026	241,081	514,164	82.5	109,274	37,650	5,867	91,475
	6 mos.	204	3,012,318	794,537	4,058,095	848,713	529,662	82,069	1,334,022	3,014,265	74.3	1,043,830	402,424	266,525	649,953
Southern Pacific	June	8,245	23,561,568	5,783,039	32,129,559	4,578,449	5,846,692	752,160	14,419,898	27,902,224	86.8	4,227,335	*344,902	3,062,249	3,761,396
	6 mos.	8,246	129,737,660	39,420,620	186,345,578	29,955,951	40,852,316	4,505,836	80,118,398	169,311,544	90.9	17,034,034	*1,016,174	11,217,085	19,003,867
Texas & New Orleans	June	4,322	6,184,369	1,423,809	8,185,361	1,512,887	1,184,097	232,291	3,309,342	6,672,194	81.5	1,513,167	*32,837	1,096,093	1,098,495
	6 mos.	4,322	37,819,983	9,071,068	50,454,689	9,405,892	8,541,680	1,127,572	18,962,052	40,634..98	80.5	9,820,291	665,065	6,488,905	7,138,386
Spokane, Portland & Seattle	June	944	1,399,638	110,158	1,607,338	549,340	201,893	15,928	655,990	1,494,682	93.0	112,656	25,025	885	203,655
	6 mos.	944	7,684,625	617,328	8,925,721	2,931,550	1,145,703	101,305	3,531,623	8,129,572	91.1	796,149	395,142	—162,071	1,707,836
Tennessee Central	June	286	263,464	14,660	294,432	48,002	54,595	7,387	142,811	268,819	91.3	25,613	28,390	—21,274	—8,353
	6 mos.	286	1,475,755	104,165	1,678,057	310,059	312,761	40,687	733,198	1,484,216	88.4	193,841	148,160	—48,647	150,445
Texas & Pacific	June	1,873	3,622,600	832,779	4,886,218	739,495	699,164	141,780	1,742,932	3,611,516	73.9	1,274,702	447,431	700,972	1,078,502
	6 mos.	1,873	10,198,898	5,870,966	27,749,908	4,277,400	4,250,940	814,051	9,499,874	20,610,949	74.3	7,138,959	2,290,257	3,962,124	4,532,399
Texas Mexican	June	162	156,312	69	173,774	61,717	20,023	5,037	89,876	187,430	107.9	—13,656	20,639	—48,389	43,565
	6 mos.	162	1,011,717	2,027	1,140,754	327,823	128,825	28,133	371,443	922,421	80.9	218,333	119,400	15,328	89,308
Toledo, Peoria & Western	June	...	†465	.....	†465	.....	119	.....	1,473	4,218	....	—4,683	*1,430	—3,698	178,368
	6 mos.	...	†35,892	513	†35,404	1,137	2,492	126	12,070	41,278	....	—76,682	*15,714	—60,957	1,063,376
Union Pacific System	June	9,775	19,203,361	5,628,371	27,475,462	3,866,075	5,472,364	670,563	11,466,630	23,351,102	85.0	4,124,360	2,144,432	1,233,691	4,407,600
	6 mos.	9,776	115,766,194	35,016,257	166,934,823	22,996,369	33,626,048	3,932,319	64,079,848	136,068,851	81.5	30,865,972	15,731,464	11,025,761	19,970,799
Utah	June	111	125,128	.....	125,343	22,595	32,117	829	43,824	105,352	84.1	19,991	12,853	14,943	15,797
	6 mos.	111	681,184	.....	681,764	117,510	215,455	4,126	254,636	623,757	91.5	58,007	69,232	9,315	77,538
Virginian	June	661	2,324,513	8,164	2,382,300	279,538	618,174	32,641	568,389	1,565,828	65.7	816,472	383,500	479,504	796,098
	6 mos.	661	11,483,920	44,413	11,865,930	1,568,993	3,520,063	189,923	3,043,756	8,710,448	73.4	3,155,482	1,793,900	2,048,758	4,520,332
Wabash	June	2,393	5,034,900	618,199	6,026,438	1,125,903	968,237	205,862	2,739,869	5,333,234	88.5	693,204	*134,817	433,095	731,080
	6 mos.	2,393	30,879,251	3,951,656	37,361,559	5,933,361	5,976,784	1,220,047	16,506,759	31,363,216	83.9	5,998,343	975,057	2,962,425	4,955,754
Ann Arbor	June	294	449,801	8,057	484,283	74,605	101,081	19,344	228,444	438,056	90.5	46,227	30,768	5,656	87,590
	6 mos.	294	2,819,783	36,536	2,935,723	399,391	578,493	112,955	1,444,220	2,619,110	89.2	316,613	172,596	67,202	385,172
Western Maryland	June	839	2,628,218	32,505	2,760,102	279,421	487,762	58,566	867,665	1,801,159	65.3	958,943	427,000	563,647	477,092
	6 mos.	839	13,767,217	227,662	14,636,535	1,957,952	2,907,426	350,910	5,149,766	11,048,940	75.5	3,587,595	1,662,000	2,162,249	3,271,484
Western Pacific	June	1,195	2,614,064	501,533	3,243,846	481,105	551,689	114,714	1,523,191	2,843,878	87.7	399,968	175,531	165,065	628,553
	6 mos.	1,195	14,957,410	4,052,944	19,750,263	3,184,938	3,410,335	674,805	7,708,119	16,028,560	81.2	3,721,703	1,646,004	1,575,044	3,354,999
Wheeling & Lake Erie	June	505	1,709,417	1	1,790,697	297,541	340,479	51,037	643,990	1,392,042	77.7	398,655	291,336	255,990	280,823
	6 mos.	505	8,421,363	14	8,709,020	1,412,515	1,992,170	297,733	3,459,127	7,520,204	86.4	1,188,816	1,316,760	941,517	1,831,567
Wisconsin Central	June	1,051	1,591,435	95,338	1,847,342	296,430	244,741	48,087	811,412	1,470,755	79.6	376,587	118,776	180,501	432,336
	6 mos.	1,051	9,197,852	561,666	10,697,535	1,504,810	1,757,502	281,958	5,058,981	9,016,609	84.3	1,680,926	497,975	424,339	1,542,882

* Cr.
† Dr.

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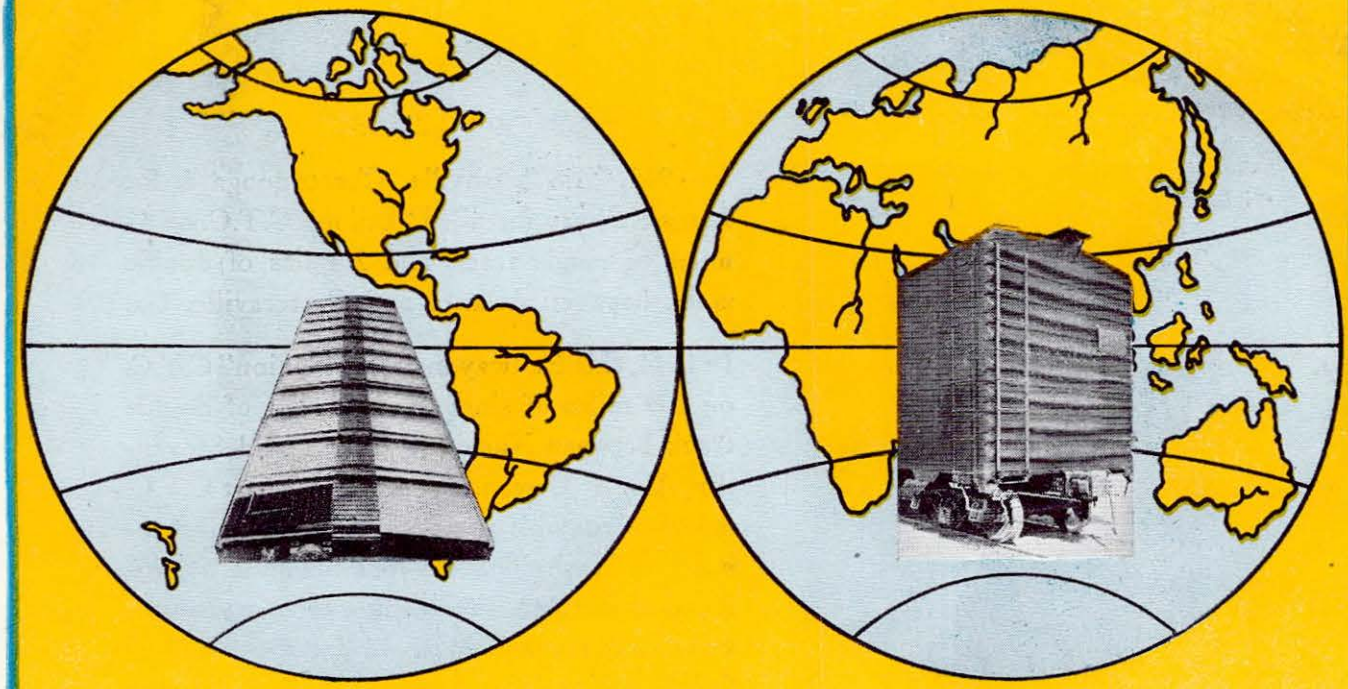
"Standard"

ROOFS AND ENDS



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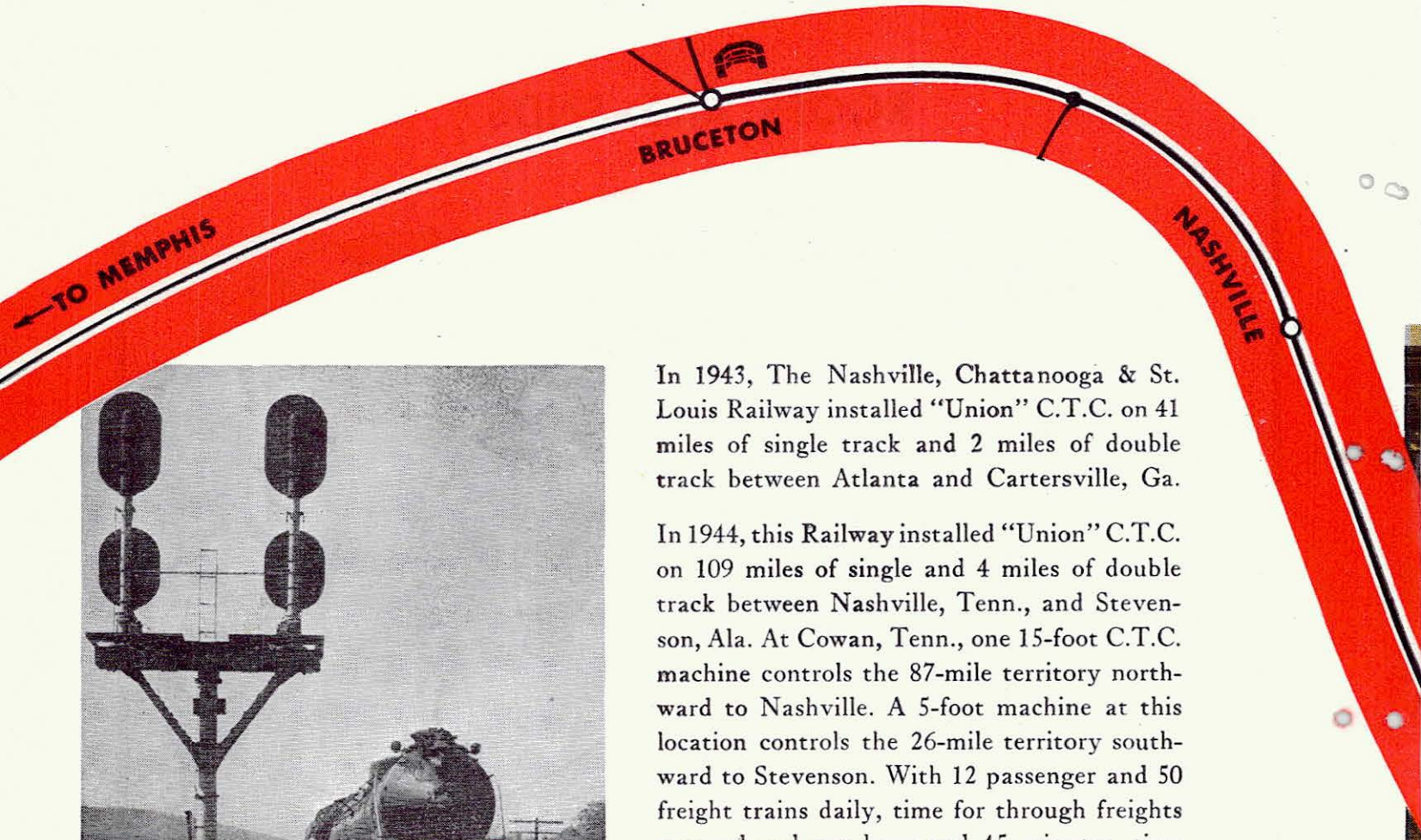
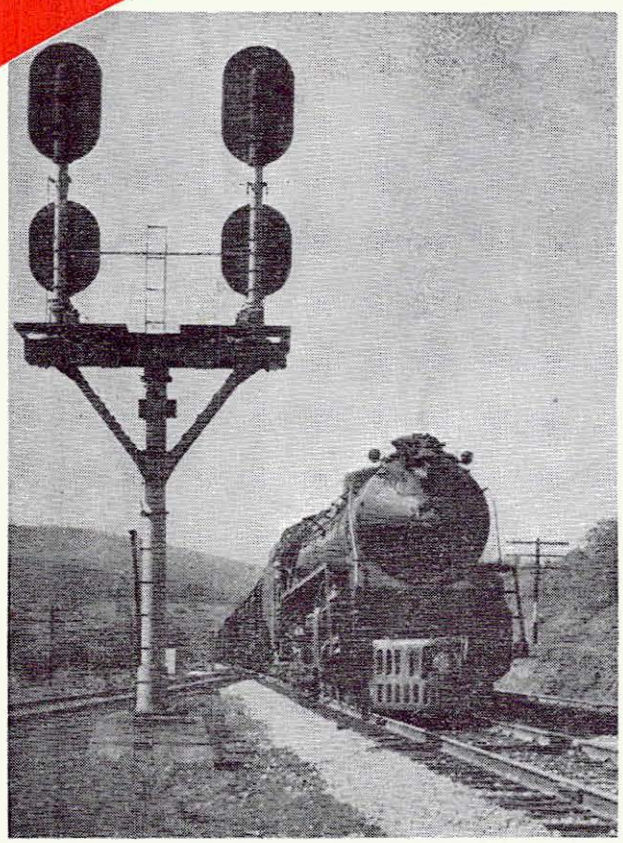
HAMMOND, INDIANA

WORKS: HAMMOND, INDIANA — NEW KENSINGTON, PA.

CHICAGO OFFICE—310 S. MICHIGAN AVE.

64% of The N. C. & St. L. Atlanta-Memphis main line will soon have "UNION" Centralized Traffic Control





In 1943, The Nashville, Chattanooga & St. Louis Railway installed "Union" C.T.C. on 41 miles of single track and 2 miles of double track between Atlanta and Cartersville, Ga.

In 1944, this Railway installed "Union" C.T.C. on 109 miles of single and 4 miles of double track between Nashville, Tenn., and Stevenson, Ala. At Cowan, Tenn., one 15-foot C.T.C. machine controls the 87-mile territory northward to Nashville. A 5-foot machine at this location controls the 26-mile territory southward to Stevenson. With 12 passenger and 50 freight trains daily, time for through freights was reduced one hour and 45 minutes, time for local freights reduced two hours and 30 minutes, for passenger trains 19 minutes.

Small wonder then that The N.C. & St.L. extended its Centralized Traffic Control!

In 1945, another 95 miles—from Nashville west to Bruceton—was C.T.C. equipped. A single machine at Bruceton controls this territory. Maximum time savings have not been realized because a dam project on the Tennes-

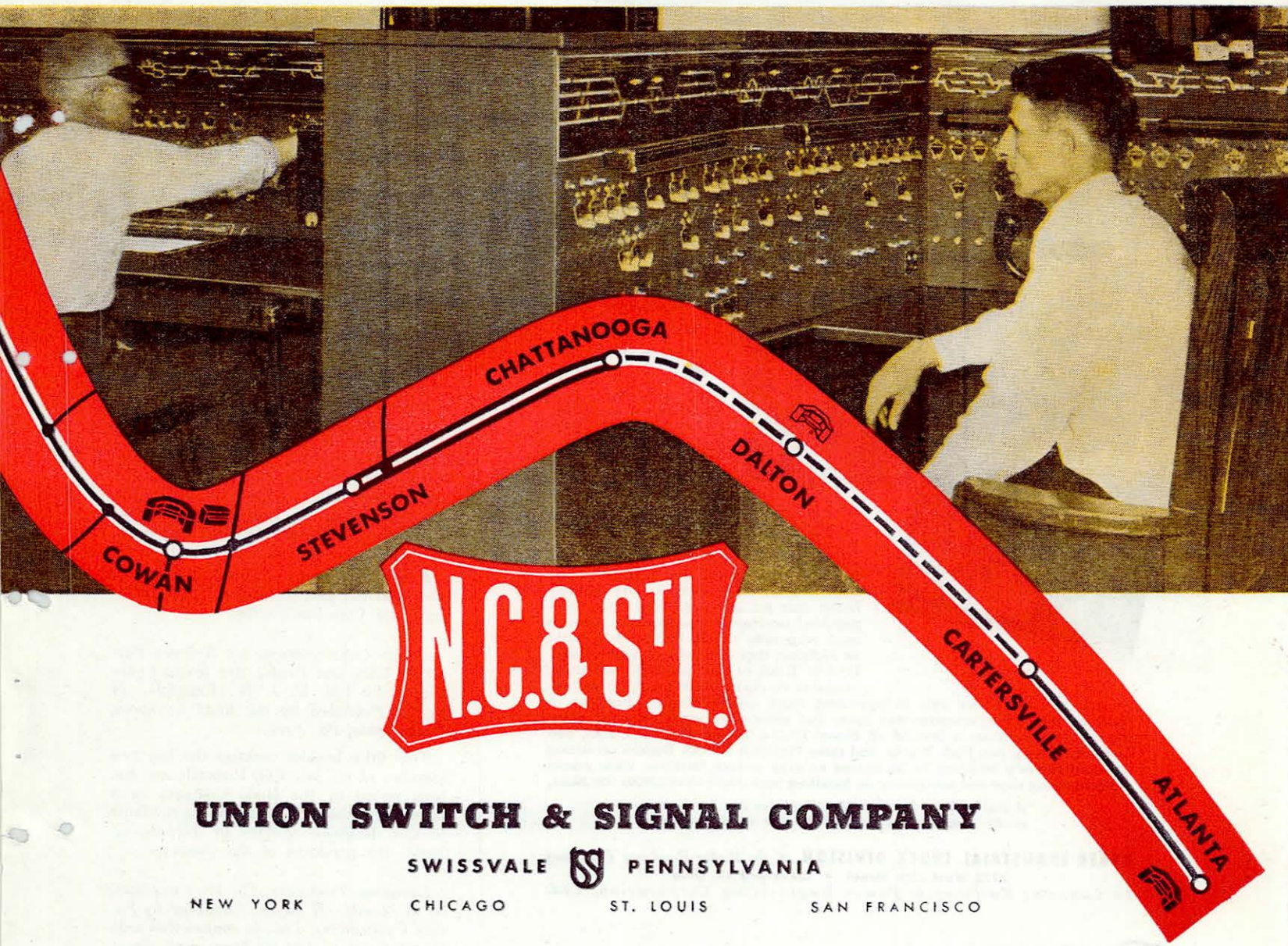
"UNION" SAVES YOU

TRAIN OPERATION BY SIGNAL INDICATION

see River has necessitated relocation of about ten miles of track and delayed completion of this portion of the C.T.C. installation. However, through freights are even now saving an hour.

And now additional C.T.C. is being installed on the 87-mile territory between Cartersville, Ga., and Chattanooga, Tenn. A 10-foot machine, located at Dalton, Ga., will control this territory. When this construction is completed, 64% of the 526.6 miles of main line from Atlanta, Ga., to Memphis, Tenn., will be controlled by "Union" C.T.C. Every mile from Atlanta to Bruceton will be C.T.C. except four miles in the Nashville Terminal area and 38 miles of double track between Chattanooga and Stevenson.

This is how just one railroad is extending and consolidating its "Union" C.T.C. trackage for efficient and economical train movement. "Union" engineers will gladly work with you in applying Centralized Traffic Control to your specific operating conditions.



UNION SWITCH & SIGNAL COMPANY

SWISSVALE PENNSYLVANIA

NEW YORK CHICAGO ST. LOUIS SAN FRANCISCO

MORE THAN IT COSTS

Vertical Storage with BAKER TRUCKS

more than doubled Storage Facilities

Hy-Lift Truck illustrated has oversize "safety" platform providing greater carrying space. Operator can raise or lower load by remote control from the platform.

(Inset, above) Baker Low-Lift Truck moves capacity load easily up a 10% ramp 70 feet long.

(Below) This 4000 lb. Baker Truck does double duty. Besides its own big load, it hauls a loaded trailer.

In 1926, Merck & Co., Inc. bought its first Baker electric truck. Twelve years ago they found that storage along horizontal lines provided inadequate warehousing space to meet increasing needs. Rather than build an addition, they decided to install a Baker Hy-Lift Truck to tier material, thus using available vertical storage space. So successful was this truck—not only in providing more storage capacity but also in speeding material movement—that more and more were installed, until today the Company operates a fleet of 18 Baker Trucks: Eleven Hy-Lift Trucks, two Low-Lift Trucks, two Fork Trucks, and three Platform Trucks. Besides obviating the need for new building by increasing existing storage facilities, these trucks are conserving time and manpower on handling operations throughout the plant.

A Baker Material Handling Engineer can help you make similar savings. Write for information.

BAKER INDUSTRIAL TRUCK DIVISION *of the Baker-Raulang Company*
2172 West 25th Street • Cleveland 13, Ohio
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Baker INDUSTRIAL TRUCKS

323 (Adv. p. 130)

Current Publications

Pamphlets

A Commercial Survey of South America, made by Philip A. Webb, Jr., and Jose M. Giralt [for the Illinois Central Railroad], 22 pages, illustrations. Inquiries should be addressed to Oliver J. Williford, Jr., Manager, Foreign Freight Traffic, Illinois Central System, 135 E. 11th place, Chicago 5, Ill.

This pamphlet comprises the report of Messrs. Webb and Giralt, who were designated by the Illinois Central to make a commercial survey of South America. The purposes of this survey were twofold—to tell South America about the tremendous industrial and agricultural importance of the Middle West and Mississippi Valley of the United States and to ascertain accurate on-the-spot information for the Middle West and Mississippi Valley respecting their future trade possibilities with South America.

Railway Inspection, 24 pages. Published by the Railway Gazette, 33 Tothill street, Westminster, S. W. 1, London, England. Price, one shilling.

A review of regulations to promote safety on British railways.

The Transport Situation in Europe, compiled by the European Central Inland Transport Organization, 79 Avenue des Champs Elysées, Paris, VIIIe, France. No. 8, May, 1946, 59 pages. Price, five shillings.

This month's summary contains recent information on the status and working of the European railway, road transport and inland waterway systems, and, in addition, a review of the freight and passenger car situation in various countries of Western Europe.

Lord Mount Stephen (1829-1921) and the Canadian Pacific Railway, by D'Alton C. Coleman, 24 pages. A Newcomen Address delivered at a National Newcomen luncheon held in honor of Dr. Coleman, in the ballroom of the Pierre, at New York, N. Y., on July 11, 1945. Printed at the Princeton University Press, Princeton, N. J.

A brief biography of Lord Mount Stephen and the part he played in the building of the Canadian Pacific.

Design Considerations for Railway Passenger Cars, and People Are Going to Go Places, by Col. E. J. W. Ragsdale. 24 pages. Published by the Budd Company, Philadelphia, Pa. Free.

This little booklet contains the last two speeches of the late Col. Ragsdale and has been issued by the Budd Company as a memorial to him. It also contains a tribute to Col. Ragsdale written by Edward G. Budd, the president of the company.

European Transport, The Way to Unity, by M. Zwalf. 39 pages. Published by Fabian Publications, Ltd., in conjunction with Victor Gollancz, Ltd., 11 Dartmouth Street, London, S.W.1, England. Price, two shillings.

This pamphlet is a report prepared for a committee of the Fabian International Bureau. It discusses the European transport problem, with particular emphasis on the desirability, obstacles and purposes of unification.

Union Pacific Railroad, a Brief History. 32 pages. Issued by E. C. Schmidt, Executive Assistant, Union Pacific Railroad, Omaha 2, Neb.

Contains a brief history of the building of the road from Council Bluffs, Iowa, to Promontory, Utah, plus a short description of later extensions and an outline of the road's subsequent history. The line's present services, equipment orders, and safety record are given brief mention, and the present scope of its business outlined. There are many pictures of early and present day operations. A short bibliography of both fiction and non-fiction dealing with the history of the line is included.

The Transport Situation in Europe, compiled by the European Central Inland Transport Organization, 40 Grosvenor Square, London, W. 1, England. No. 7, April, 1946, 55 pages. Price, five shillings.

In addition to the usual information on traffic and the car and locomotive situation in the various European countries, this issue contains a section on "The United States as a Source of Supply," a table showing UNNRA's locomotive, freight car and road vehicle program for certain European countries, and a chart showing the repatriation of freight cars in certain of these countries.

Inland and Intracoastal Waterways in World War II. 11 pages, charts, maps. Issued by the American Waterways Operators, Inc., 1319 F Street, N. W., Washington 4, D. C. Free.

Based on data furnished by the Board of Engineers for Rivers and Harbors, Corps of Engineers, U. S. Army, this pamphlet reviews the operations on the various waterways during the recent war. The movements of the commodities handled are outlined; also the construction of seagoing vessels and their subsequent journey down to the sea. One section contains charts and statistics showing the ton-miles handled on each of the waterways from 1927 through 1944, and another contains maps showing the movement of the various commodities. A list of vessels and other structures constructed on the Mississippi River system for war purposes and moved by water to New Orleans and beyond between January 1, 1942, and September 30, 1945, is also included.

Railways of Ecuador, prepared by Irma Grace Bate for publication in the Transportation Unit, Bureau of Foreign and Domestic Commerce, United States Department of Commerce. Six pages. Available from the Government Printing Office, Washington 25, D. C. Price, five cents.

This pamphlet, which is issued as Volume 4, Part 1, Number 9, of the Industrial Reference Service, outlines the railroads of Ecuador and their operations. A map of the various railroad systems is also included.

ANOTHER BOWSER SYSTEM

for SAFE, CLEAN HANDLING of OIL HOUSE LIQUIDS . . .

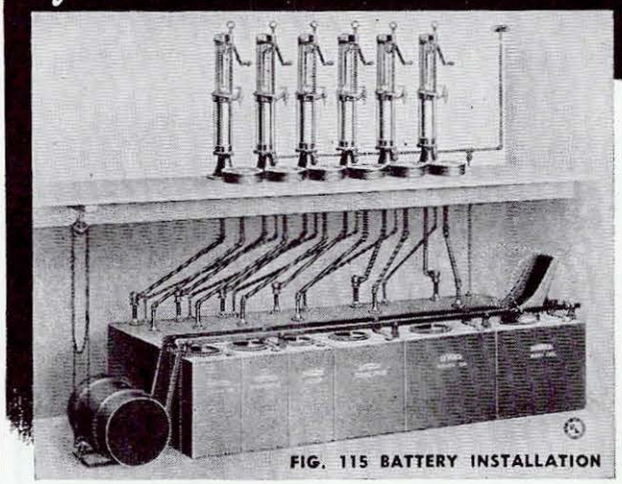

FIG. 115 BATTERY INSTALLATION

. . . for lube oils, paint oils, varnishes and similar liquids. May be installed singly or in any combination. Especially suited for pit or cellar installations. Similar self-contained equipment available for above floor installation.

BOWSER FEATURES

Galvanized Steel Tank — Drip-Pan Return
Bolted Man-Hole Cover — Rivet Soldered Construction
Simplified Installation — Accurate Measurement
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. . . a non-measuring type for dispensing signal oils, gasoline, kerosene, etc. along wayside points . . . can be furnished complete with underground storage tank and all fittings for permanent installation. Write for Railroad Catalog today.

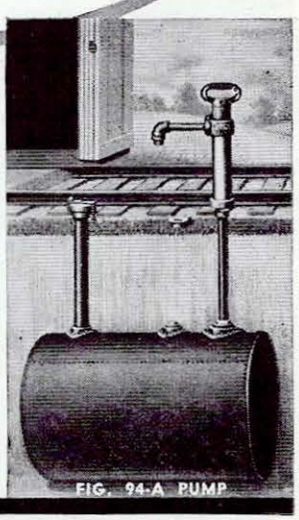

FIG. 94-A PUMP

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A Complete Line of Liquid-Handling Systems For Railroads

- Fueling systems designed for your individual needs.
- Proportioning and blending systems of absolute accuracy.
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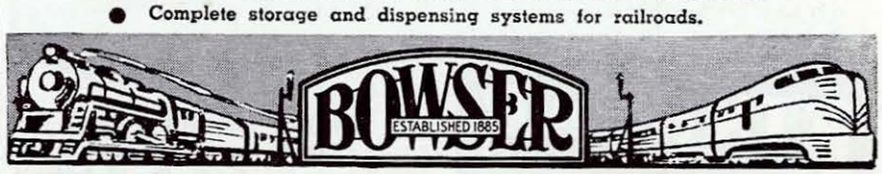

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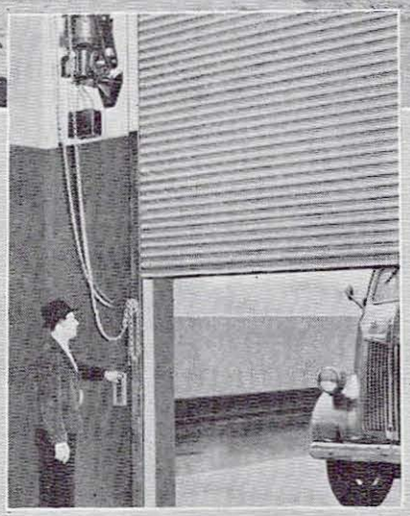
KINNEAR STEEL ROLLING DOORS

Kinnear Rolling Doors in one of the modern shops of the Great Northern Railway Company, St. Paul Minnesota.



You keep doorways in step with modern transportation's increasing demands for *time-saving efficiency* and *low maintenance* when you install Kinnear Rolling Doors. They combine all the space-saving advantages of *coiling upward action* with the protective strength of *all-metal construction.*

The smooth, easy action of Kinnear's famous interlocking-slat curtain speeds door traffic. The entire door coils quickly out of the way *above* the opening. All surrounding floor and wall space is fully usable at all times. The opened door is always completely safe from damage by wind or vehicles. Its rugged metal construction defies wind, storms and intruders . . . resists fire . . . stands up under years of punishing use. And with Kinnear Rolling Doors, you get *maximum* benefits from the motorized, push-button operation (with remote control stations if desired) offered by Kinnear Motor Operators. Write for complete data on Kinnear Rolling Doors — today!

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1742 Yosemite Ave., San Francisco 24, California

Annual Reports, How to Plan and Write Them, by Beatrice K. Tolleris. 39 pages. Published by the National Publicity Council, 130 E. 22nd St., New York 10, N. Y. Price, $1.

While written primarily for the use of those who have to prepare annual reports for social agencies, schools, etc., the suggestions contained in it might be applied to the writing of other types of annual reports. The subjects covered include organizing your facts, getting acquainted with your audience, telling your story, tackling the problem of statistics and planning the physical format.

Books

Improving London's Transport; A Publication of the Railway Gazette describing the New Works Scheme of the L. P. T. B., the L. N. E. R., and the G. W. R. 108 pages, maps, illustrations. Published by the Railway Gazette, 33 Tothill St., Westminster, London, S. W. 1, England. Price, five shillings.

An account of the scope and extent of the work planned to improve the passenger transport situation in the London rapid transit territory.

Passenger Class Distinctions, by Charles E. Lee. 76 pages, illustrations. Published by the Railway Gazette, 33 Tothill Street, London, Westminster, S.W.1, England. Price, six shillings.

Reviews the history of passenger travel on British railways. Subjects covered include the development of the three classes of traffic, early main-line traffic, lighting and heating of, and smoking in, cars, workmen's fares, the basis of passenger fares and reduction of classes. Sketches of early English passenger cars as well as illustrations of travel in the early days are included.

Transportation Principles and Problems, by Truman C. Bigham, 626 pages. Published by the McGraw-Hill Book Company, Inc., 330 W. 42nd street, New York 18, N. Y. Price, $5.00.

Designed for college courses in transportation, this text covers railroads, motor carriers, pipe lines, airways and inland, coastwise and intercoastal waterways. The first four chapters seek to provide a background for the discussion of important questions; the next four give an account of state and federal transport legislation; nine chapters are devoted to rate making and the remaining ones discuss service, security issuance, combination, labor, public aid, government ownership, and the general improvement of public policy.

The Lives of the Interstate Commerce Commissioners and the Commission's Secretaries, by C. A. Miller, 175 pages, illustrations. Published by the Association of Interstate Commerce Commission Practitioners, 2218 I. C. C. Building, Washington 25, D. C., as Section Two of the June, 1946, issue of the I. C. C. Practitioners' Journal. Price, to non-members, $2.50.

This book brings down to date the biographical sketches of Interstate Commerce commissioners which first appeared in the

Interstate Commerce Commission 50th Anniversary Issue of the George Washington Law Review in 1937. Biographies of commissioners appointed since that time are included, as well as those of the secretaries of the commission. Photographs of the commissioners and secretaries accompany their biographies and an introductory section contains general information about the commission, such as tenure of office, salaries, table showing appointments, etc.

Oliphant's Earning Power of Railroads, Forty-first Issue, 1946, edited by Floyd W. Mundy, 556 pages, maps. Compiled by Jas. H. Oliphant & Co., 61 Broadway, New York 6, N. Y. Price, $5.

This standard reference manual contains financial data concerning all important railroads of the United States, together with system maps.

Trains Albums of Railroad Photographs, No. 14 (Erie Railroad) and No. 15 (Great Northern Railway). Published by the Kalmbach Publishing Company, Milwaukee 3, Wis. Price, $1 each.

These books of photographs represent two more in the series issued by this company. Both contain introductory pages of text briefly describing the railroads. The photographs which follow have been chosen to illustrate the particular operations and scenes for which the roads are best known.

Big Dan; The Story of a Colorful Railroader, by Frank Cunningham, 350 pages, illustrations. Published by the Deseret News Press, Salt Lake City, Utah. Price, $3.25.

The biography of Daniel G. Cunningham, for over thirty years an officer of the Denver & Rio Grande Western, and an outstanding figure in Rocky Mountain life.

Economic Factors Influencing Railroad Employment, by Maurice Parmelee. 152 pages. Published by the United States Railroad Retirement Board, Office of Director of Research, 844 Rush St., Chicago 11, Ill. Free.

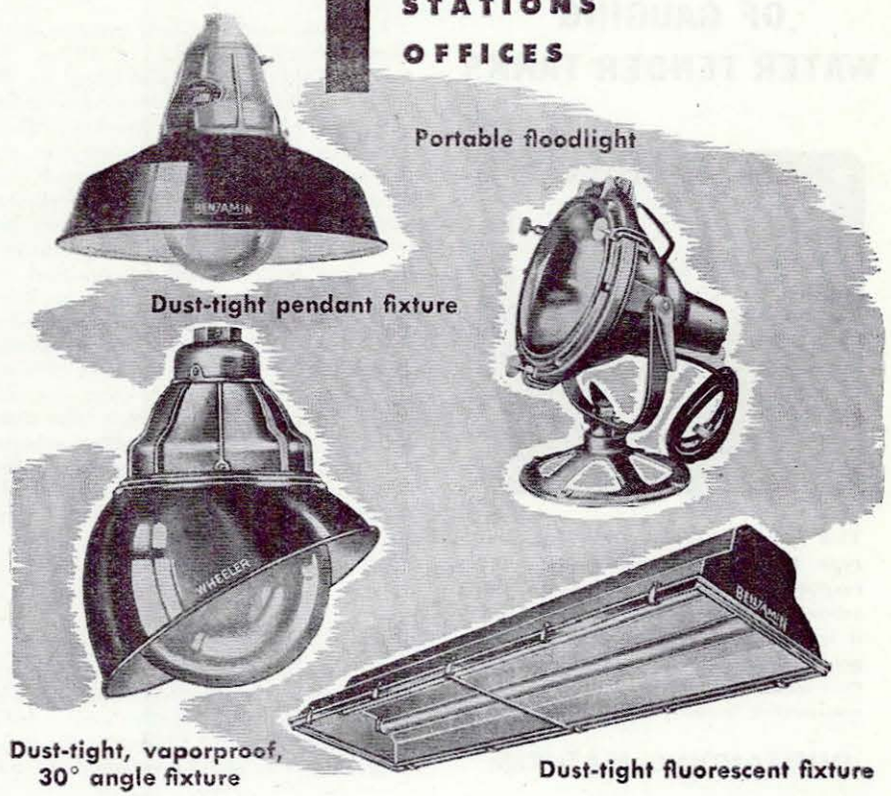
An analysis of some of the factors which affect production and determine the volume of employment, and, therefore, railroad employment and the work load and obligations of the railroad retirement and unemployment insurance systems.

Summary Tables of the Fifty-Eighth Annual Report on the Statistics of Railways in the United States for the Year Ended December 31, 1944. 228 pages. Prepared by the Bureau of Transport Economics and Statistics, Interstate Commerce Commission, Washington, D. C. Available from the Government Printing Office, Washington 25, D. C. Price, 65 cents.

Contains complete financial and operating statistics on the railroads of the United States, and includes selected data for the Pullman Company, Railway Express Agency, electric railways, carriers by water, oil pipe lines, motor carriers, freight forwarders and private car owners subject to the Interstate Commerce Act for the year 1944.

History of the British Railways During the War, 1939-45, by R. Bell. 291 pages. Published by the Railway Gazette, 33

LIGHT for
RAILROAD SHOPS
YARDS
ROUNDHOUSES
PITS
TUNNELS
PLATFORMS
STATIONS
OFFICES



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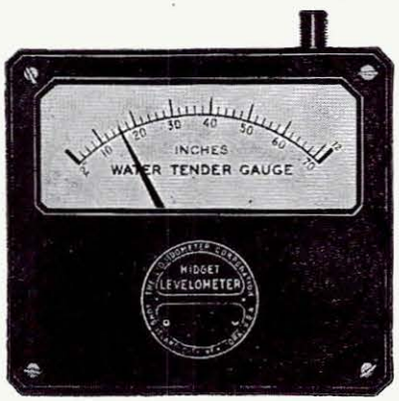

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1. ***Dial type, easy to read.***
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3. ***Simple to install.***
4. ***A suitable length of ½" pipe is all that is required within the tender tank.***
5. ***Designed and built by the country's largest manufacturer of Liquid Level Gauges.***

The I.C.C. has ordered all water tender tanks to be equipped with water level indicators not later than June, 1948. Here is an inexpensive and efficient way to meet the Commission's requirements by equipping your tenders with Midget Levelometers . . . We can also furnish liquid level gauges for any of your stationary storage tanks.

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Tothill St., Westminster, London, S. W. 1, England. Price, 25 shillings.

Reviews the operations of the railroads during the war, with chapters outlining, among other things, the financial arrangements during government control, wartime organization of the main-line companies, air raid precautions and effects of aerial warfare on railway operations. A number of orders and agreements issued during the war are included as appendices, as are various Honors Lists issued during the period.

Legislative and Judicial History of the Commodities Clause, by C. A. Miller. 299 pages. Published and distributed by the American Short Line Railroad Association, 1120 Tower building, Washington 5, D. C.

In this volume the vice-president and general counsel of the association has brought together more or less in chronological order, comprehensive digests and texts of the legislative and court proceedings that preceded and accompanied the development of section 1(8) of the Interstate Commerce Act—generally referred to as the "commodities clause," the basic statute preserving the "purity" of the railroads as transportation agencies—and the controlling court devisions which have clarified its application. The presentation begins with the 1905 message to Congress of President Theodore Roosevelt and concludes with the 1936 decision of the Supreme Court of the United States in the *Elgin, Joliet & Eastern case.*

Trade Publications

A Pictorial Record of Pittsburgh Forgings Company and the Greenville Steel Car Company. 62 pages, illustrations. Available from Pittsburgh Forgings Company, Coraopolis, Pa., and Greenville Steel Car, Greenville, Pa. Free.

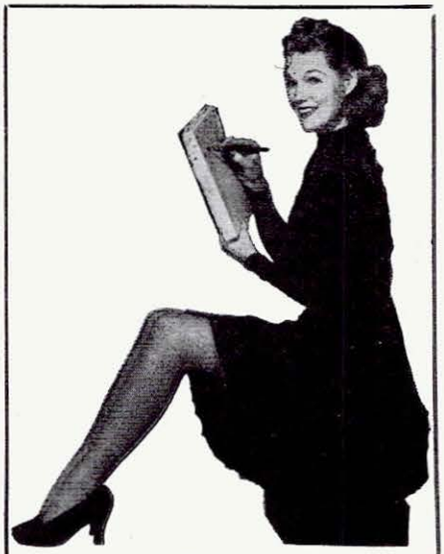
A pictorial review of the history, manufacturing facilities and war production of the two firms.

Covered Hopper Cars. 8 pages, illustrated. Published by the American Car and Foundry Company, 30 Church street, New York 18, N. Y.

This bulletin gives blue-print sketches and illustrations, with principal weights and dimensions, of three covered-hopper cars built by American Car and Foundry Company for the handling of commodities such as dry chemicals, cement, and other granular products.

Hanna Coal, a survey of the resources, facilities and services of the M. A. Hanna Company and its affiliates. 20 pages, illustrated with maps and color pictures. Published by the M. A. Hanna Company, Cleveland 14, Ohio.

This elaborate brochure shows the many steps in the production and distribution of the commodity which is the railroads' greatest source of tonnage, placing emphasis on the necessary integration of the several phases of mining, preparation, transportation, marketing and consumption of coal requisite to the most economical and satisfactory use of this basic raw material.



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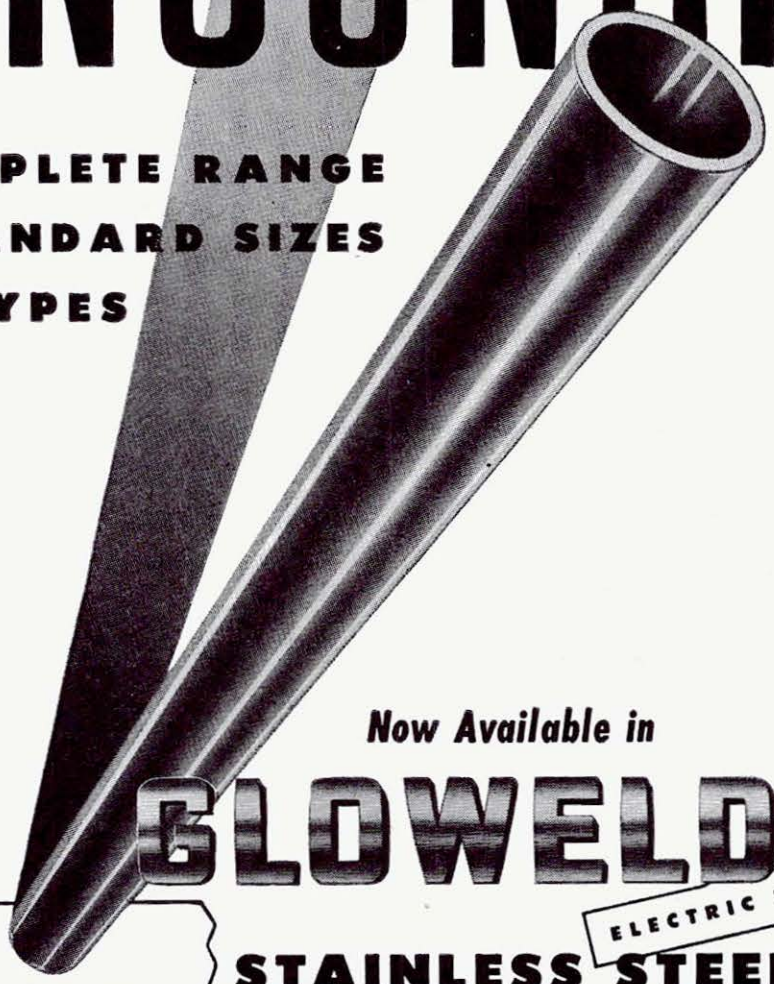

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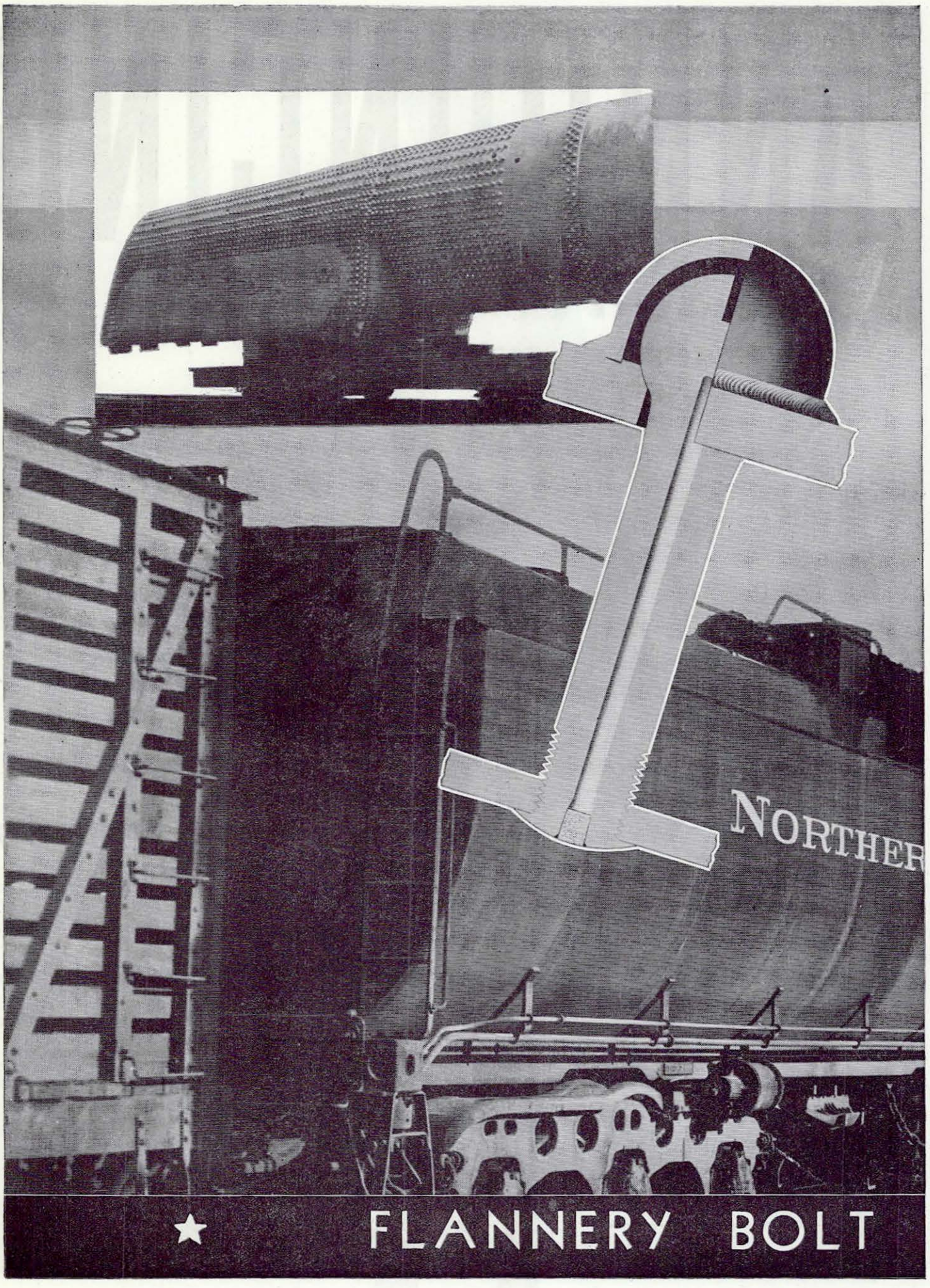
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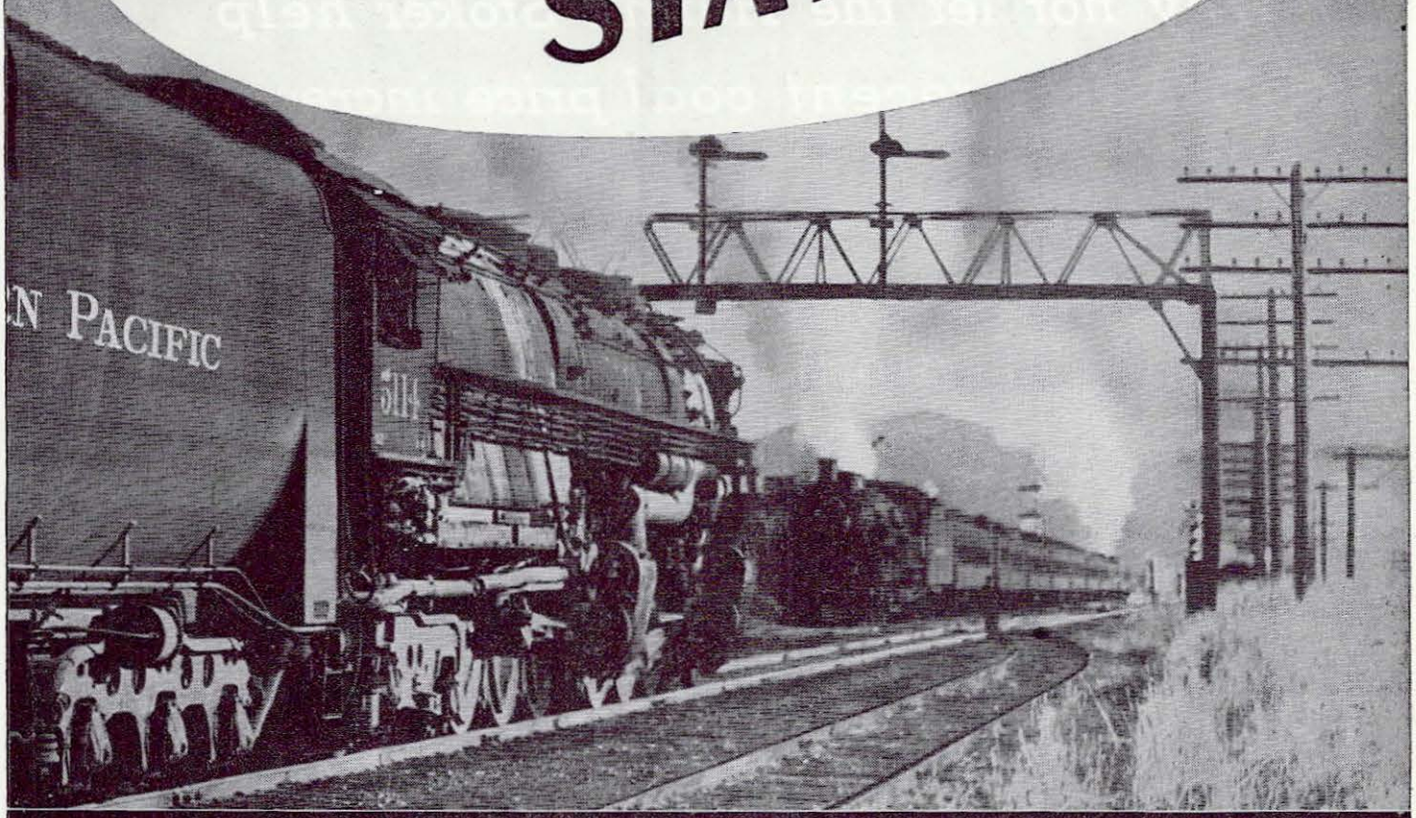

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Does Not Disturb the Even Distribution of

THE HANNA STOKER

It maintains a level fire over the entire firebed regardless of speed

Why not let the Hanna Stoker help YOU offset recent coal price increases?

Since 1911 HANNA STOKER DEVELOPMENT has paced improvements in locomotive power, efficiency and economy.

THE HANNA STOKER COMPANY

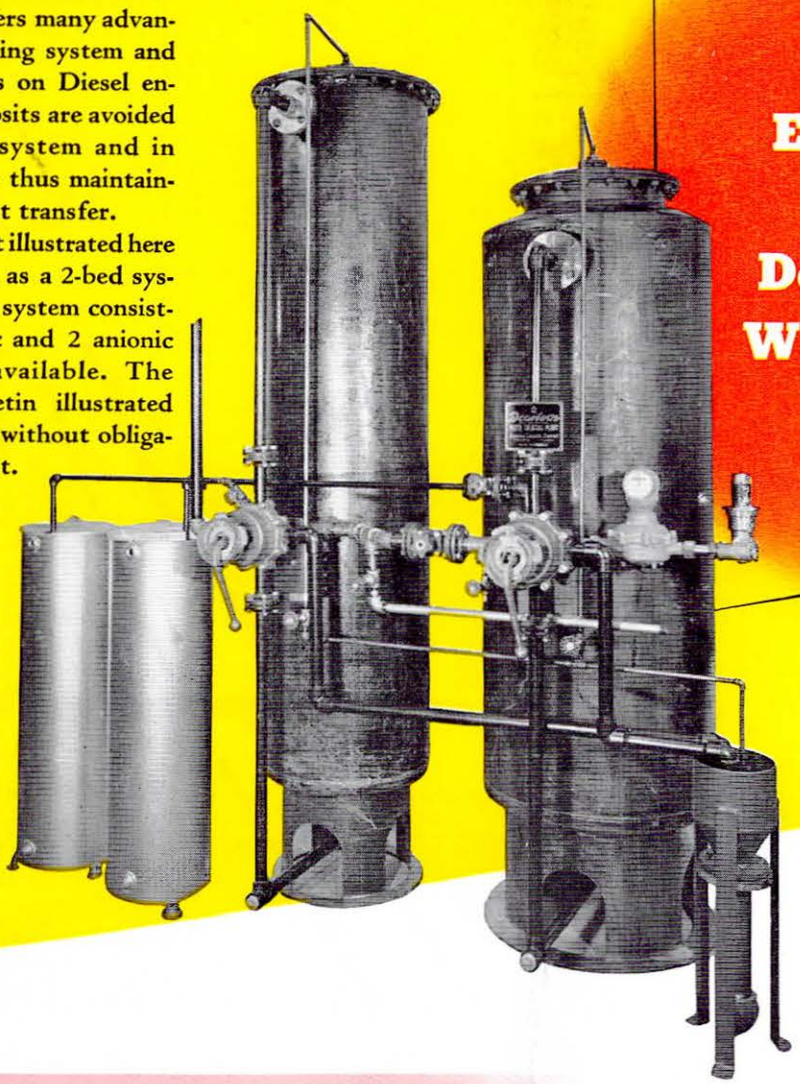
Cincinnati 27, Ohio

Dearborn Equipment for Producing De-Mineralized Water for Diesel Engines

Dearborn Aqua Matic De-Ionizers produce water of high purity comparable to distilled water but at a substantial saving under the cost of distillation.

The use of distilled or de-ionized water offers many advantages in the cooling system and steam generators on Diesel engines. Scale deposits are avoided in the cooling system and in steam generators thus maintaining optimum heat transfer.

The equipment illustrated here is what is known as a 2-bed system, but a 4-bed system consisting of 2 cationic and 2 anionic units is also available. The descriptive bulletin illustrated here will be sent without obligation upon request.



Write for this Bulletin on your letterhead. It explains how the Dearborn Aqua Matic De-Ionizing System operates.

BUT WATER OF HIGH PURITY IS NOT THE COMPLETE ANSWER! UNLESS SUCH WATER HAS ITS HUNGER SATISFIED, DESTRUCTIVE PITTING AND CORROSION WILL OCCUR.

Water of high purity readily dissolves solids, and gases. Unless this hunger is satisfied by normalizing the water in a proper way, the untreated de-mineralized water in the cooling system or steam generator is equivalent in its action to that of weak acid. The use of distilled water, therefore, only partly solves the water problem on Diesels.

DEARBORN NOT ONLY FURNISHES THE DE-MINERALIZING PLANT, BUT ALSO SUPPLIES THE PROPER FINISHING TREATMENT.

Dearborn laboratories have developed the scientific finishing treatment to overcome this objection. On some railroads where single Diesel engines are operating the finishing treatment is mixed and applied to the water manually. Where sufficient Diesels are in service to warrant the expense, Dearborn will install a wayside treating plant where they can be serviced with water containing the proper dosage of finishing treatment.

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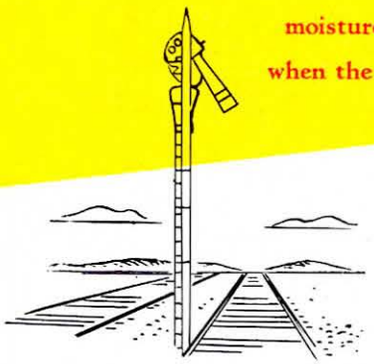
wherever corrosion of ferrous metal has to be stopped NO-OX-ID will do the work. When applied to steel it mechanically excludes moisture and oxygen . . . it chemically inhibits any underfilm corrosion which may be present when the coating is applied. A few of the uses are suggested below.



Prevents Rust at its Source

IN CAR SHOPS . . .

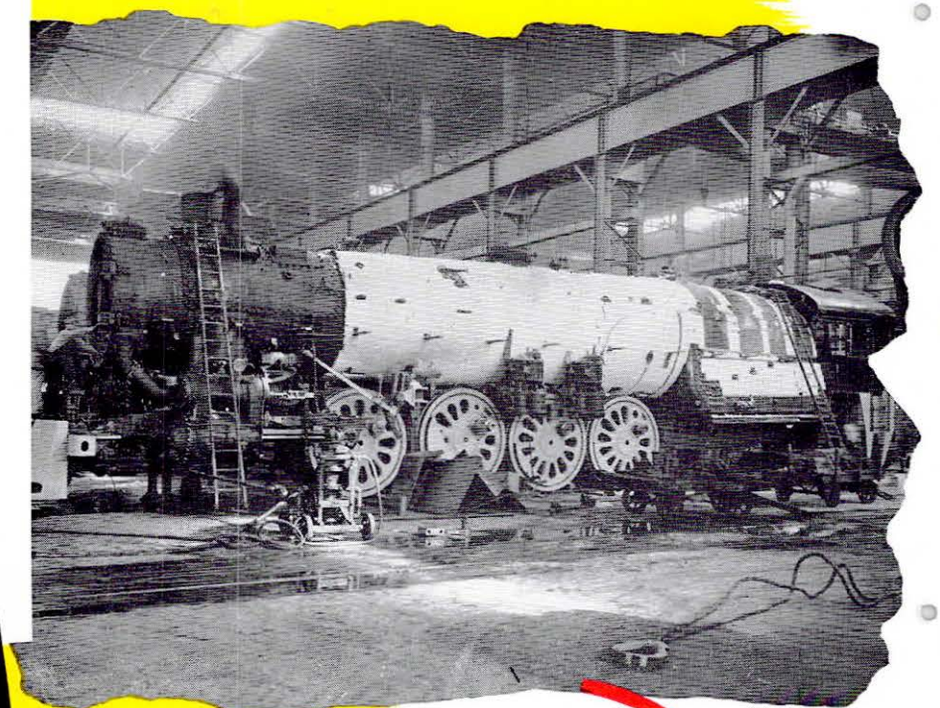
The use of NO-OX-ID Filler Red C on metal-to-metal contact areas insures watertight seams, as well as thorough protection against corrosion. All riveted joints and laps of underframe sides, and ends should be coated with NO-OX-ID when cars are built. Other points needing protection are inside of body bolster construction and center sill.

(Photo courtesy:—American Car and Foundry Company.)

IN BACK SHOPS . . .

Protecting vulnerable parts of locomotive with NO-OX-ID is standard practice in many railroad shops. Here are some parts that need this protection: Outside surface of boiler before lagging is put in place; under side of jacket steel. On new tenders all metal-to-metal contacts of Tee and Angle Irons inside tank; entire inside surface of water tank including splash boards; tender coal space and all surfaces which must be protected against corrosion.

(Photo courtesy:—Baldwin Locomotive works.)



NO-OX-ID IRON + OX = RUST

REG. TRADEMARK AUG. 27, 1918

The ORIGINAL RUST PREVENTIVE

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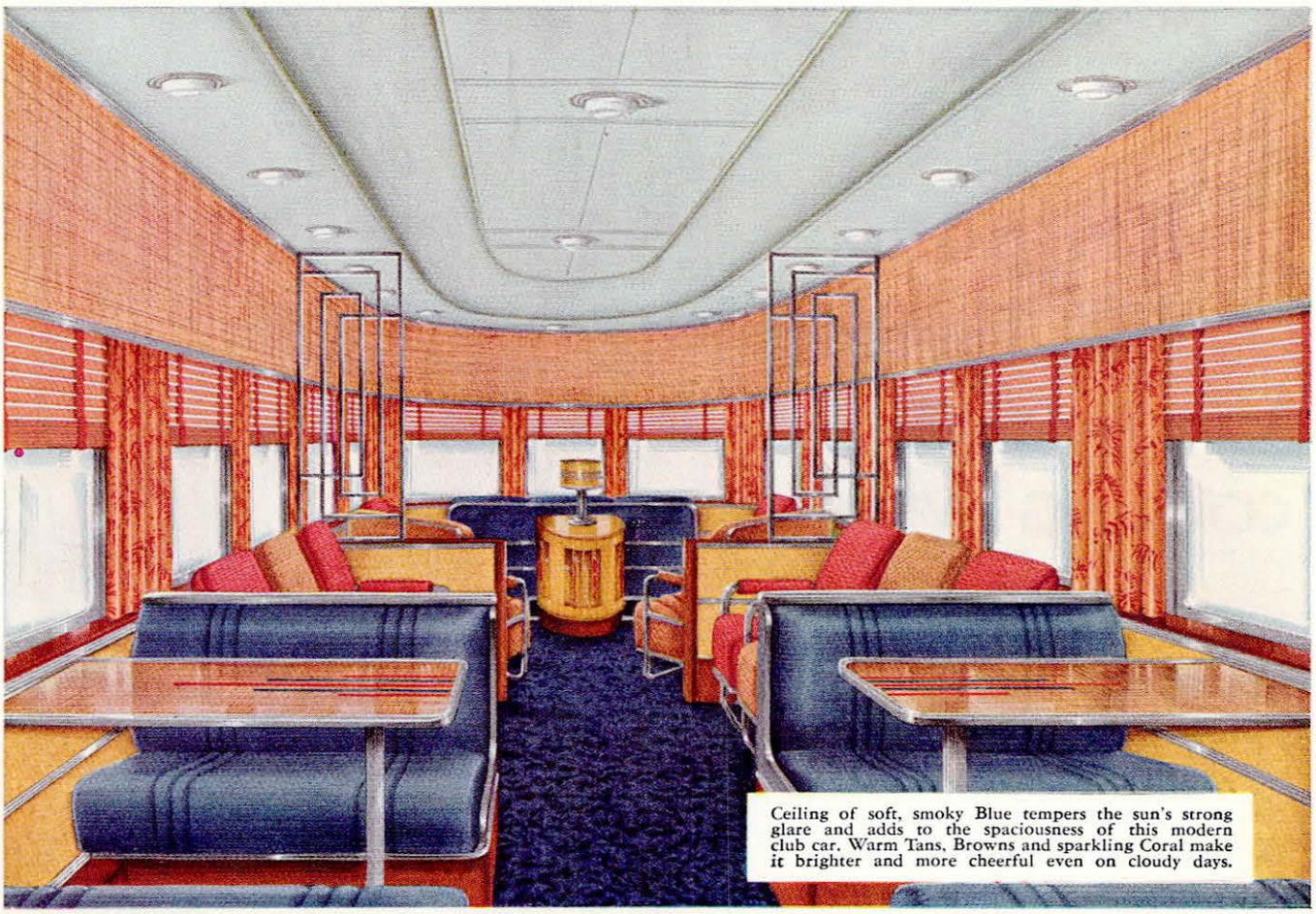

Ceiling of soft, smoky Blue tempers the sun's strong glare and adds to the spaciousness of this modern club car. Warm Tans, Browns and sparkling Coral make it brighter and more cheerful even on cloudy days.

Now . . . Pittsburgh's COLOR DYNAMICS adds to comfort and pleasure of modern rail travel!

Chicago & NorthWestern Railway Utilizes Principles of *Energy in Color* in Smart New "400" Club Car—Designed by Pullman Standard.

AS THE PRESSURE of wartime tasks are relaxed and railroad companies are being given the opportunity to modernize their passenger-carrying equipment, Pittsburgh's system of COLOR DYNAMICS takes on added significance.

For many years, Pittsburgh color experts and technicians have studied the influence of color upon human beings. Their tests have disclosed that color, properly used, stimulates people, helps them relax, feel more cheerful, work more efficiently.

This new knowledge of the use of color for functional as well as decorative purposes is now available to the entire railroad industry.

A striking example of the application of the principles of COLOR DYNAMICS is the interior of the Chicago & NorthWestern Railway's new "400" Club Car, designed and built by the Pullman Standard Car & Manufacturing Company. By the proper use of color, this car has been made restful and inviting as well as beautiful.

In like manner, individual sleeping rooms and drawing rooms can be made more cheerful and comfortable as well as attractive, dining cars can be made more inviting as well as pleasing, lounge and observation cars can be made stimulating and exciting as well as captivating to the eye. COLOR DYNAMICS can also be used to contribute to the greater safety of passengers and train crew.

Why not avail yourself of Pittsburgh's highly successful experience with COLOR DYNAMICS in many fields? We'll be glad to discuss your modernization problems without obligation to you at your convenience.

PITTSBURGH Provides a High-Quality Finish for Every Railway Need!

PASSENGER CAR ENAMELS—in a wide range of colors . . . CARHIDE—to repaint freight equipment almost overnight . . . STATIONHIDE—for swift and thorough coating of stations . . . LAVAX SYNTHETIC ENAMELS—for locomotives . . . IRONHIDE for bridges.

Enriched with Pittsburgh's exclusive *"Vitolized Oils"* to keep paint film *live*, tough and elastic—provide long-lasting protection. Many finishes contain oils improved by Molecular-Selection to make them easier to apply, dry more quickly and give more uniform performance.

PITTSBURGH PLATE GLASS COMPANY, Industrial Paint Division, Pittsburgh, Pa. Factories: Milwaukee, Wis.; Newark, N. J.; Houston, Texas; Los Angeles, Calif.; Portland, Ore. Ditzler Color Division, Detroit, Mich. The Thresher Varnish Co., Dayton, Ohio.

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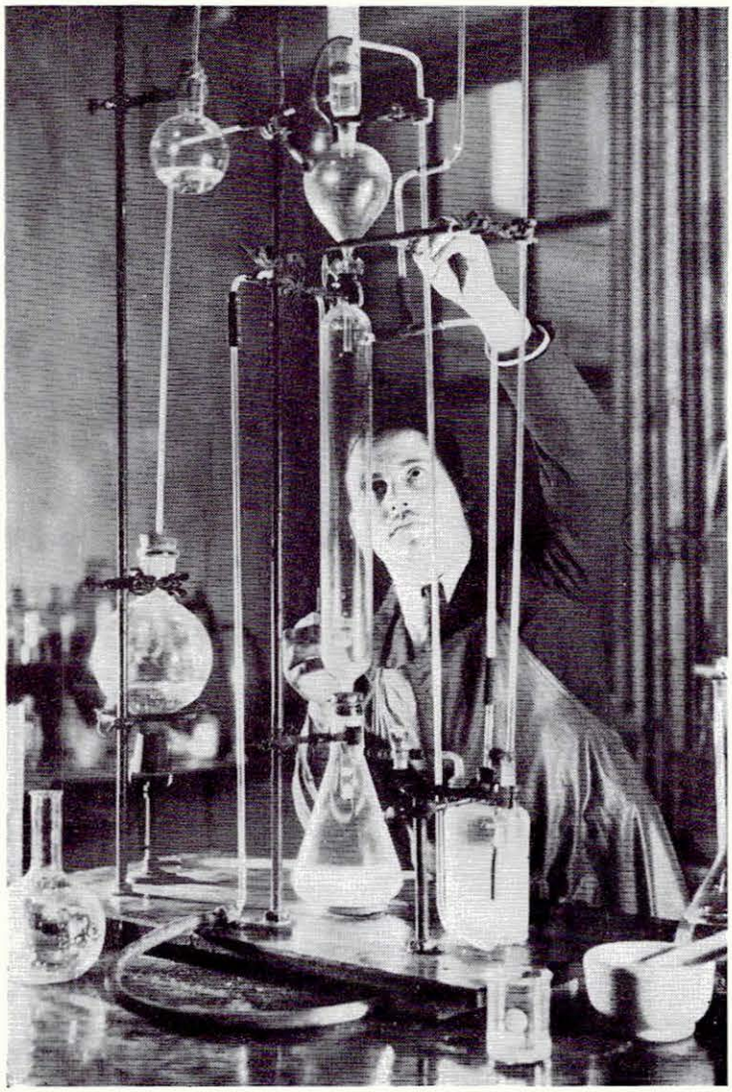
RH 8020 FIGHTS TROUBLE IN DIESEL COOLING SYSTEMS



Corrosion ranks among the most insidious enemies of Diesel efficiency. "Bad" water alone does not cause it. All water attacks cylinder liners to form iron oxide which clogs radiators and pipes and multiplies pump wear. Even if you cannot see it happen, the results are always plain in lowered availability and high maintenance costs.

It is to be expected that Bird-Archer engineer-chemists should come up with the answer to Diesel corrosion. RH 8020, born of laboratory and field investigation, is a chromate-bearing material that inhibits cylinder liner corrosion and insures a clean cooling system. Like every B-A water treatment, you can depend upon RH 8020 to do the job.

TRADE MARK

B-A WATER TREATMENT

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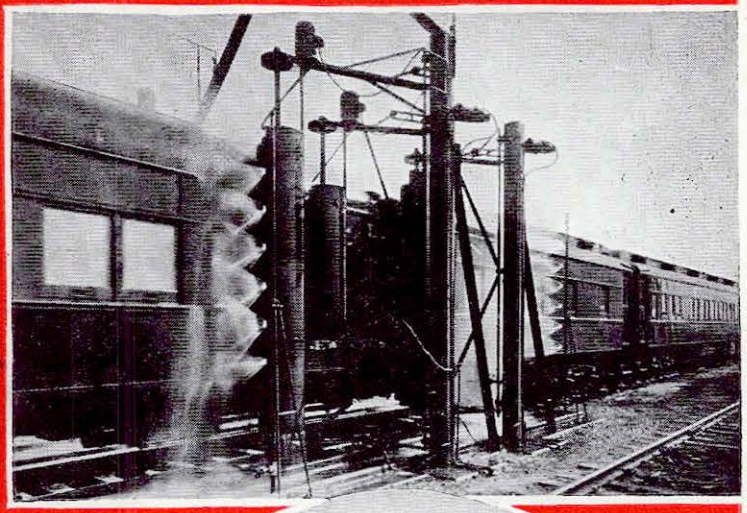
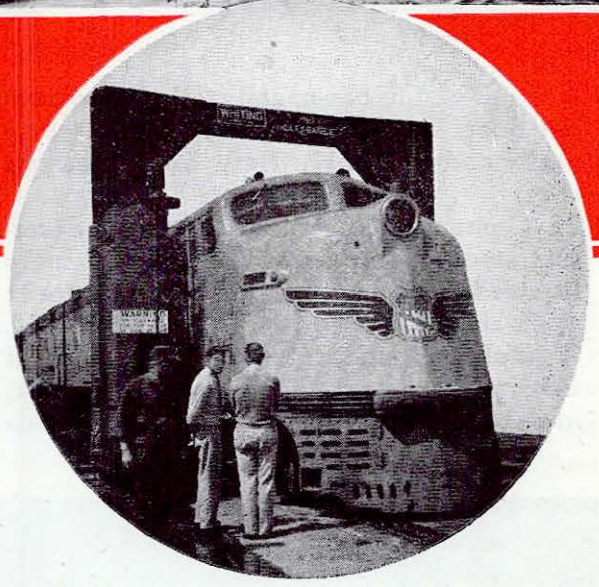
Chicago Office . . Wrigley Bldg. Laboratory & Plant . . 4337 N. American St., Philadelphia

In the solution tank of your
Automatic Coach-Washing Equipment

Use Safe
Oakite Compound
No. 88
for CLEANING of extra dirty coaches!





Removal of the many different types of tenacious road film so frequently encountered on surfaces of coaches, stream-liners, power units and tenders can be facilitated by adding a small amount of Oakite Compound No. 88 to the solution tank of your automatic car washing equipment.

Oakite Coach-Washing Materials Safe to Surfaces . . . Economical

Sprayed on surfaces, solutions of Oakite Compound No. 88 quickly act on stubborn road film and importantly contribute to the effectiveness of the mechanical brushing and rinsing operations. If you have already installed or plan to install automatic car washing equipment to SAVE time and REDUCE coach-washing costs, the men of our Railway Service Division will be glad to make tests of Oakite car-washing materials and give you the benefit of their wide experience on this work. Inquiries invited and promptly answered.

TOP PHOTO: *Shows Blackhall automatic car-washing equipment, manufactured by Ross and White Co.*

BOTTOM PHOTO: *Shows Whiting automatic coach-washing equipment, manufactured by Whiting Corporation.*

• • •

Both types of equipment make provision for spraying coaches, streamlined power units, etc., with a cleaning solution preliminary to brushing and rinsing operations. Various Oakite materials are available for adding to cleaning solution tanks.

OAKITE PRODUCTS, INC., WRIGLEY BUILDING, CHICAGO 11, ILL.

In Canada: OAKITE PRODUCTS OF CANADA, LTD. TORONTO: 65 Front St. East—MONTREAL: 1 Van Horne Ave.

OAKITE
RAILWAY SERVICE DIVISION

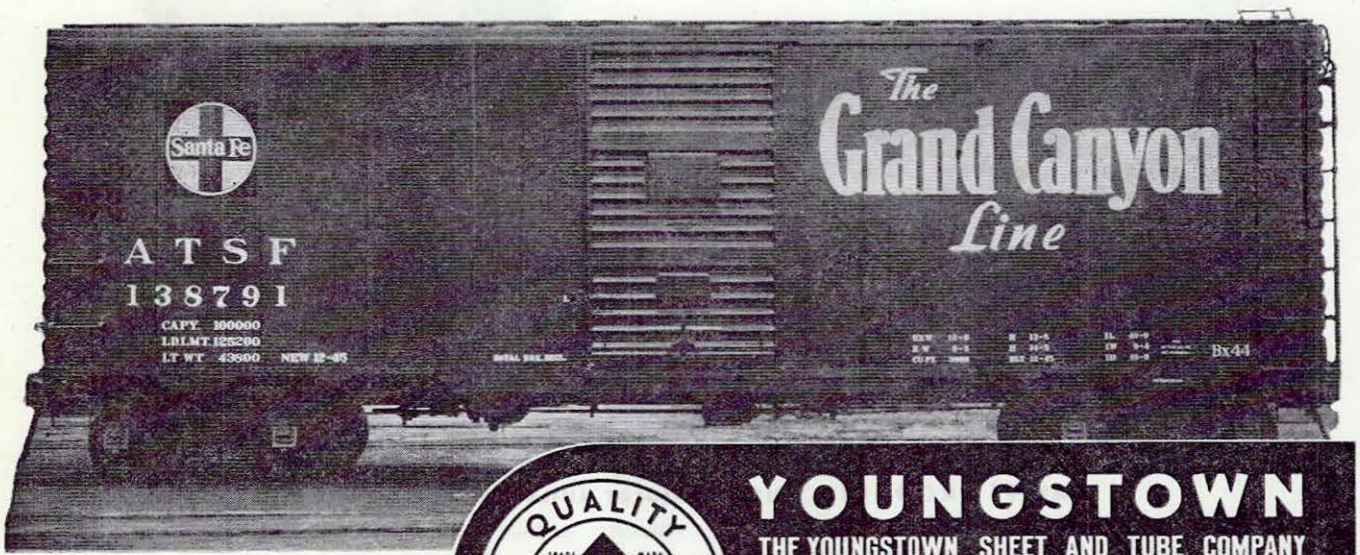
Yoloy doors!

ASK THE MAN WHO OPERATES THEM

YOU can usually tell a Yoloy boxcar door, because it opens and closes so easily and smoothly. Here are the reasons why:

1. Compared to standard hot-rolled carbon steel, a Yoloy door is 25% or more lighter in weight. This makes it easier to open and close.
2. Yoloy is much stronger and tougher than ordinary steel--more resistant to shock, impact, vibration and abrasion. It stands abuse and holds its shape better. This, also, makes a Yoloy door easier to open and close.
3. Yoloy is corrosion resistant. Therefore, a Yoloy door is not so adversely affected by moisture, or corrosive materials hauled. That, too, makes it easier to open and close.

Yoloy is Youngstown's well-known low alloy high-tensile, corrosion resistant steel. It brings you these advantages, with a greatly increased life compared to previously used materials. If you aren't acquainted with Yoloy, investigate its advantages now for boxcar doors and sides, as well as for its many other railroad uses.



One of 500 new box cars recently put into service by the Santa Fe railroad, all equipped with Yoloy doors fabricated by The Youngstown Steel Door Co.

QUALITY YOUNGSTOWN SERVICE

YOUNGSTOWN

THE YOUNGSTOWN SHEET AND TUBE COMPANY

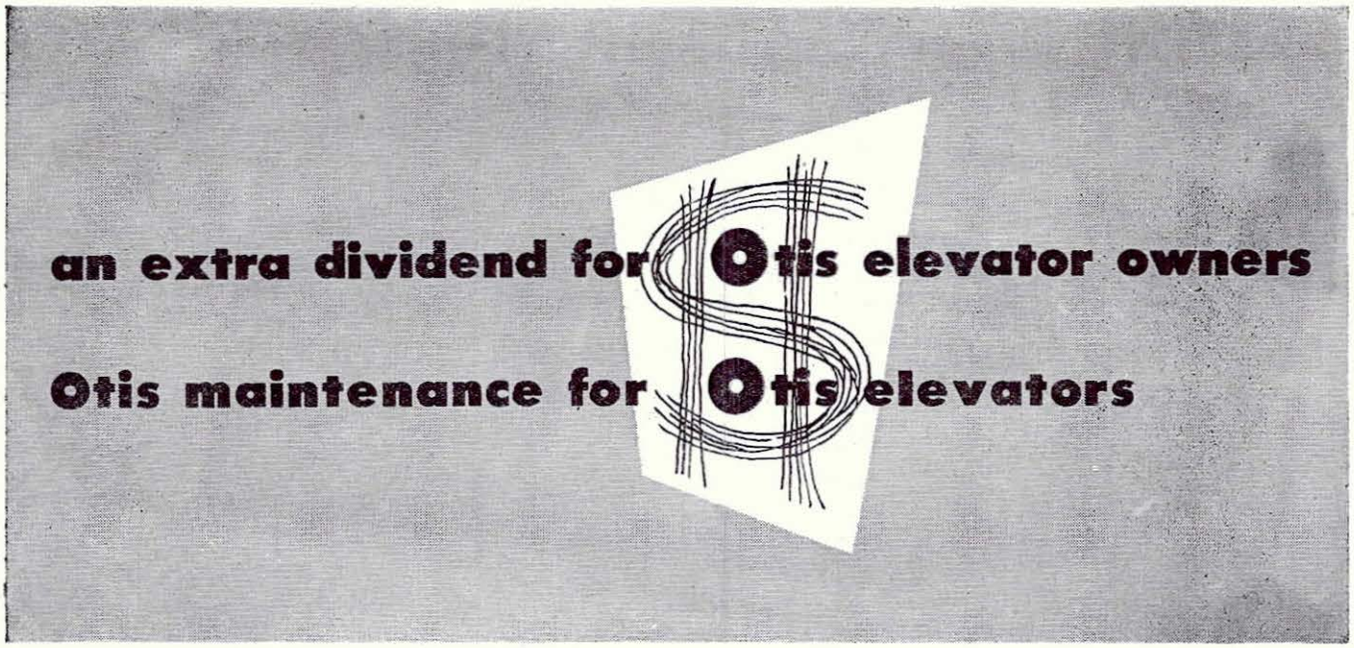
GENERAL OFFICES - YOUNGSTOWN 1, OHIO

Export Offices - 500 Fifth Avenue, New York City

Manufacturers of

CARBON - ALLOY AND YOLOY STEELS

Sheets-Plates-Pipe and Tubular Products-Bars-Rods-Wire-Cold Drawn Carbon Steel Rounds-Tie Plates and Spikes-Conduit-Electrolytic Tin Plate-Coke Tin Plate.



Otis Maintenance service is provided so quietly and with so little trouble to Otis elevator owners that many do not realize its true value to building management. ● Although it may not appear on the balance sheet, the value of this service may be measured in tenant satisfaction, more sales made or more freight moved, or in freedom from elevator care. It is especially valuable because of the spirit of the two thousand people who make up the Otis Maintenance organization. ● *Local* operations are conducted by 245 branch offices in 47 states, so that the men on the spot can act rapidly and effectively to give your building the best possible service. *District* and *zone* offices supervise field work and furnish supplies and emergency equipment. The *headquarters* organization provides all of the facilities and technical knowledge of the manufacturer. ● The service rendered is of such real and constant value that Otis Maintenance has more than doubled in volume every ten years. It could not thus increase without bringing the customers more than a dollar's worth of service value for every dollar spent. ● Otis Maintenance is a complete, flat-rate service for Otis elevators. It is available through your local Otis Elevator Company office.

Otis ELEVATOR COMPANY
OFFICES IN ALL PRINCIPAL CITIES

LOCOMOTIVE DRAFTING IS EASIER WITH A

GALE DRAFTER

The Gale Compressed Air Locomotive Drafter is designed to draft locomotives in the engine houses without utilizing steam. Compact and lightweight, the unit is easy to handle and flexible in operation. The Gale Drafter consists of a specially constructed air motor equipped with a suction-type fan, and provision for cooling the housing makes it possible to remove the drafter from the stack immediately upon completion of its task.

The Gale Locomotive Drafter is inexpensive in first cost and requires a minimum of maintenance.

NATIONAL

BOILER WASHING SYSTEMS

80 E. JACKSON BLVD. CHICAGO 4, ILL.

TUCO PRODUCTS

TUCOLITH
COMPOSITION FLOORING

A & B Types for long surface wear. L W-37 or VIII for light weight subfloor as base for ¼" thick surface of A & B Tucolith or as a base for cementing any type floor covering.

TUCO
ROCKWOOL INSULATION

Special type of felted blanket with flame-proof fabric stitched on both sides for car insulation gives highest insulating value and low weight. Specify Style M-2.

TUCO TREATED CANVAS

For car roofs and cab curtains.

TUCO-DOREX ODOR ADSORBERS

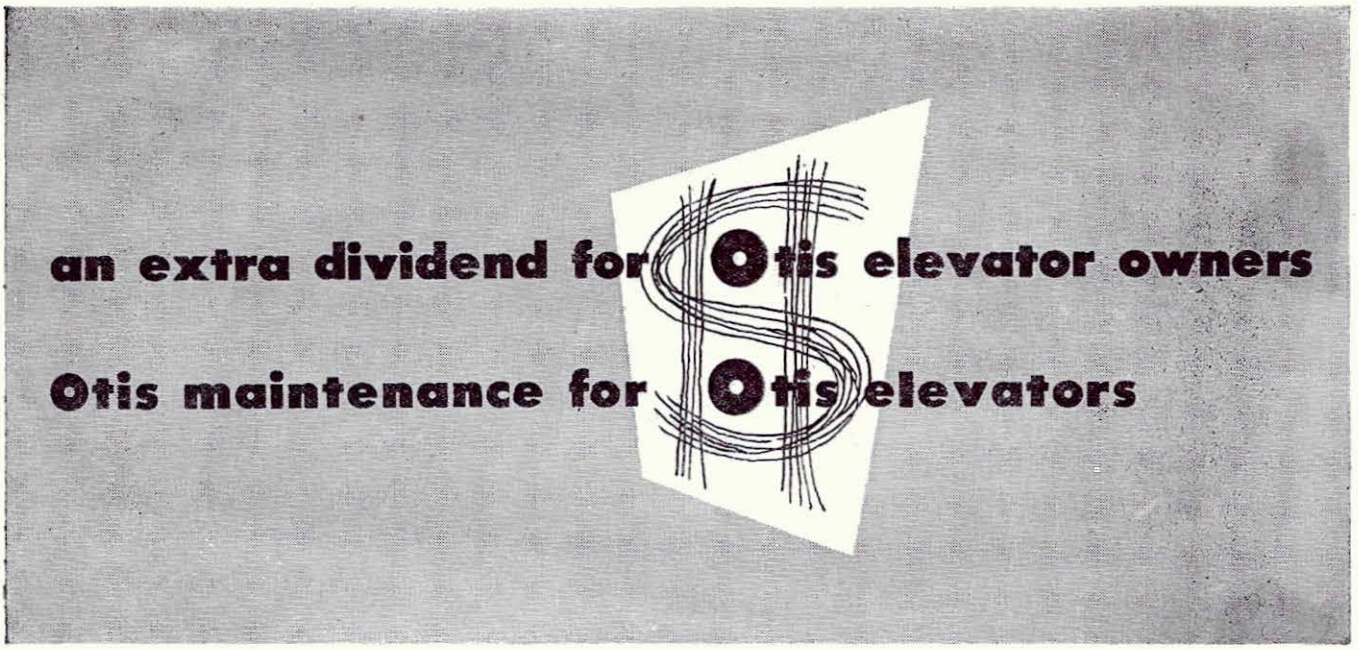
For Air-Conditioned Cars and Buses.

★ *Tuco Trap Doors* ★ *Tuco Eclipse Deck Sash Ratchets*

★ *Tuco Car Window Screens* ★ *Tuco-Seal Tape and Fabric*

TUCO PRODUCTS CORPORATION

30 Church St., New York 7, N. Y. 122 S. Michigan Ave., Chicago 3, Ill.



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Otis ELEVATOR COMPANY
OFFICES IN ALL PRINCIPAL CITIES

Underwood & Underwood

New Orleans, *the "Crescent City," metropolis of the South and home of the annual Mardi Gras.*

In cosmopolitan New Orleans, unusual dishes prepared by famous chefs are the gourmet's delight: delicious food and real hospitality are proud traditions. Here, as over the country, tablecloths, napkins and tray covers by Rosemary are preferred by leading hotels, hospitals and clubs. "Balanced construction," cross-stitched hems suggestive of hand needlework, and the permanent, deep-seated lustre of the famed *Basco Finish* combine to provide the beauty and serviceability that distinguish the . . .

"NAPERY OF THE NATION!"

**Among leading users of Rosemary-Basco napery in New Orleans:*

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**Rosemary napery is distributed exclusively through leading Wholesalers and Linen Supply Houses—the above listing, made from our own office records, is not complete.*

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Cloths • Napkins & Damasks

MADE **RIGHT** IN AMERICA

ROSEMARY SALES

A Division of Simmons Co.

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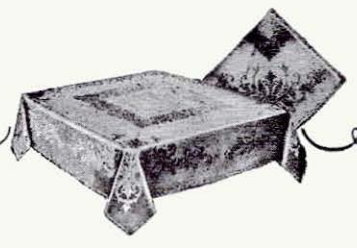
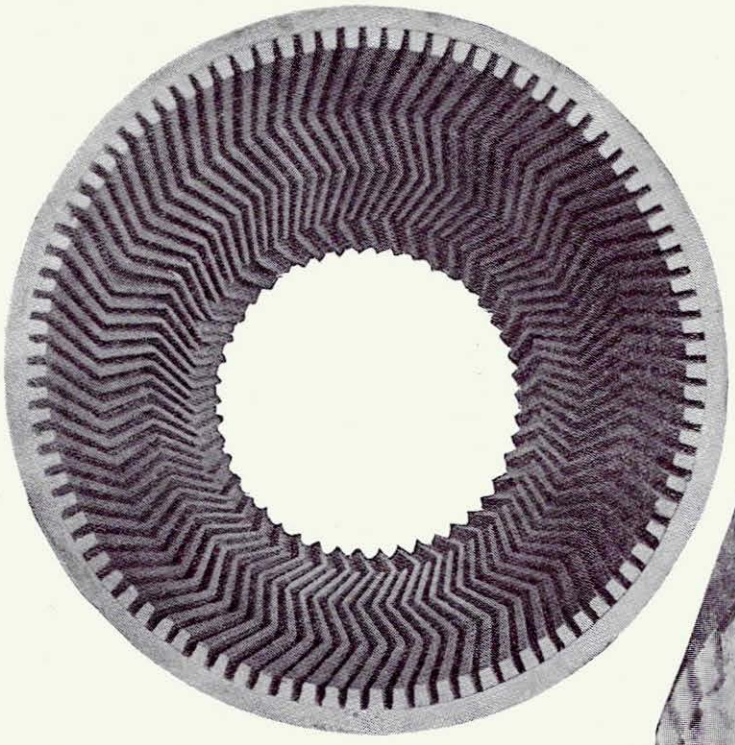
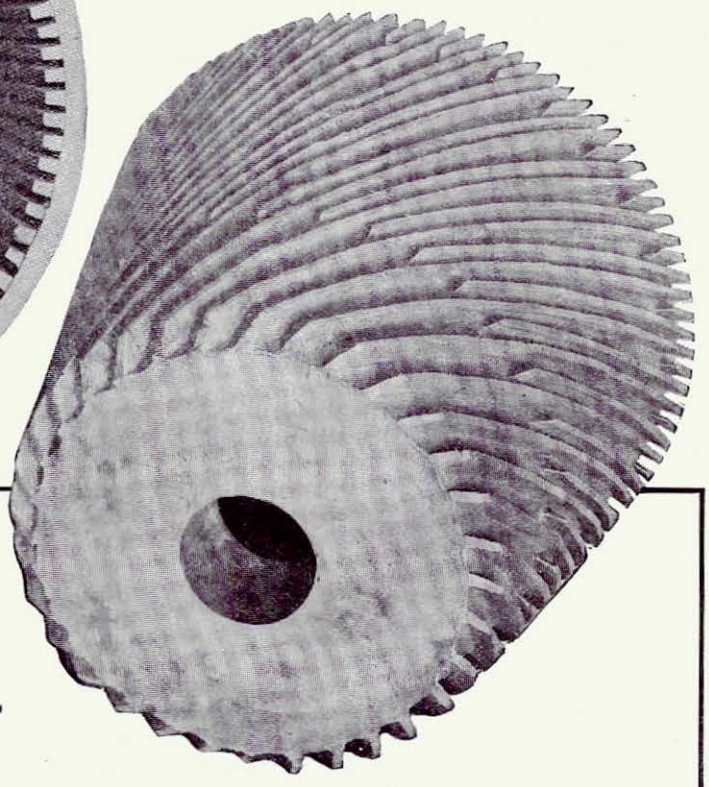




Steel Castinas for Pulp Grinders



HARD... for cutting

TOUGH... for long wear

Chewing and grinding up wood into pulp is no "sissy" job for any machine.

That's why the plugs and shells of modern pulp grinders are *cast* in alloy steel, hardened to increase its resistance to wear.

Just imagine what a job it would be, and how much it would cost, to produce these parts by any other process than casting.

Here, the designer gets the form he wants, and the metallurgist gets the properties he needs, by a simple, inexpensive process.

Remember that cast steel is not another metal. Casting is merely another way to make things out of steel. And a very practical and economical way.

Whether the parts you want are simple or complicated in design, your steel foundryman can help you with his experience, and with the extensive research of this industry behind him.

The first step in building an improved product, or in cutting costs, is to plan it that way—a steel castings engineer can help you. Steel Founders' Society, 920 Midland Building, Cleveland 15, Ohio.

MODERNIZE AND IMPROVE YOUR PRODUCT WITH

STEEL CASTINGS

LOCOMOTIVE DRAFTING IS EASIER WITH A

GALE DRAFTER

The Gale Compressed Air Locomotive Drafter is designed to draft locomotives in the engine houses without utilizing steam. Compact and lightweight, the unit is easy to handle and flexible in operation. The Gale Drafter consists of a specially constructed air motor equipped with a suction-type fan, and provision for cooling the housing makes it possible to remove the drafter from the stack immediately upon completion of its task.

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A & B Types for long surface wear. L W-37 or VIII for light weight subfloor as base for ¼" thick surface of A & B Tucolith or as a base for cementing any type floor covering.

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For car roofs and cab curtains.

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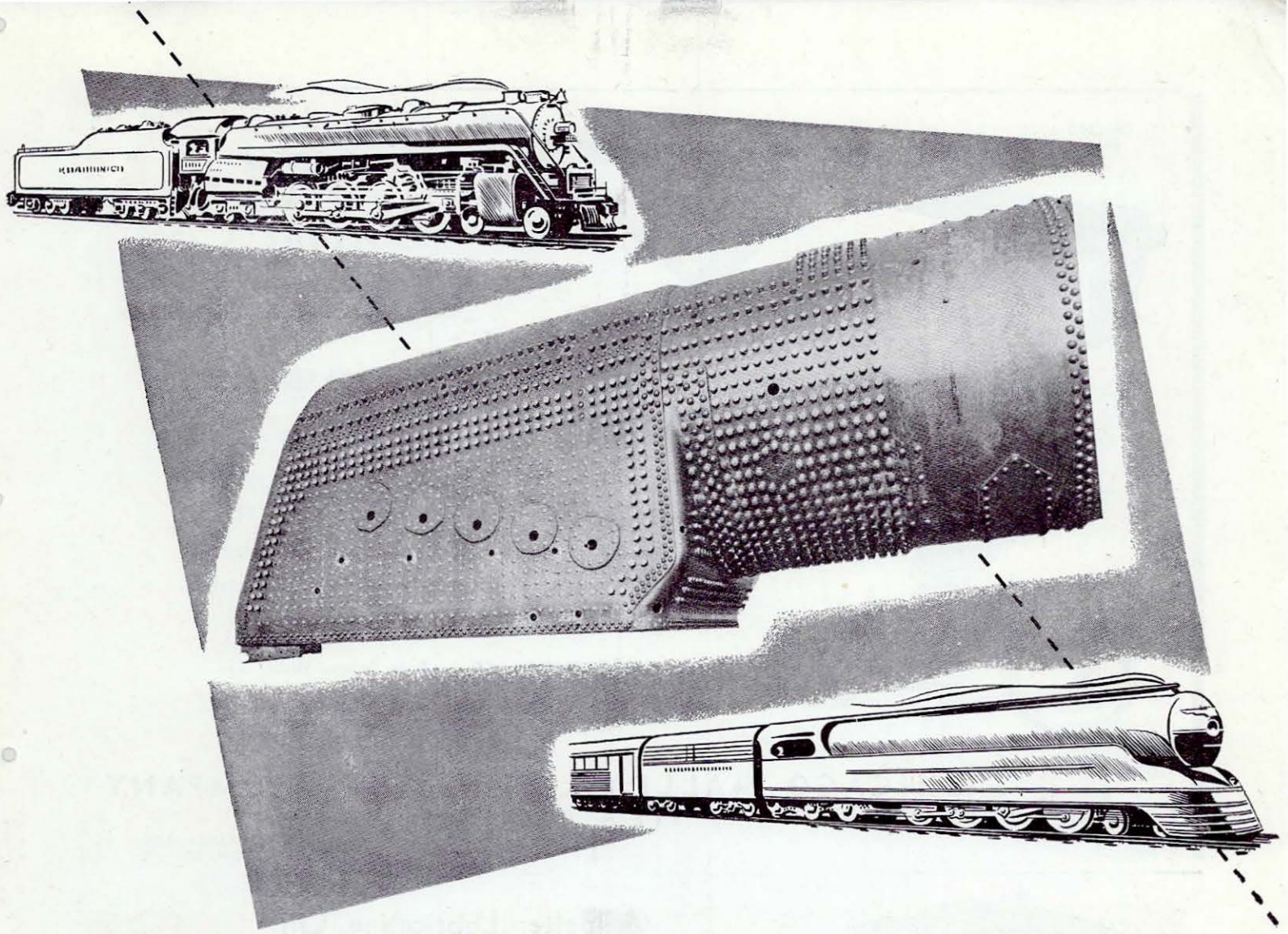

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Leading railway equipment engineers and designers specify Manganese-Vanadium Steel for boiler construction where greater horsepower must be developed for faster schedules and heavier loads.

Greater strength-to-weight ratio, demanded in modern railway equipment designs, is one of the outstanding characteristics of low carbon Manganese-Vanadium Steel. Its toughness at the high temperatures used is more than adequate for the most severe service demands in boiler and firebox applications.

Proven excellent hot-working and cold-working characteristics of ASTM A225-44 Manganese-Vanadium Steel assure ease of shop handling and good boiler construction in either welded or riveted type of boiler, thereby minimizing stress concentrations.

Our metallurgists are in close touch with developments in the field of locomotive and car construction, and will be glad to work with you in obtaining the maximum benefits to be secured by the use of Manganese-Vanadium Steel.

Makers of FERRO ALLOYS VANCORAM BRAND *CHEMICALS and METALS*

VANADIUM CORPORATION OF AMERICA

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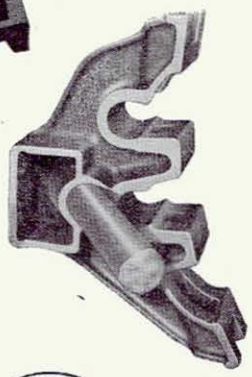
CHICAGO A.A.R. BRAKE BEAM

CHICAGO SLEEVE TYPE BRAKE HEAD



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OF ALL TYPES
— PRESENT AND FUTURE DESIGNS

Chicago BRAKE BEAMS AND REPAIR PARTS

MEET ALL A. A. R. REQUIREMENTS

Our products, made from well-known Certified malleable iron and open-hearth steel castings, backed by 47 years of continuous operation and research, are giving the superior service which has earned their high reputation.

The "L" symbol on every casting guarantees long life to the product and gives confidence to the user.

OUR SPECIALTIES—Chicago Brake Beams—Sleeve Type Brake Heads—Cast Steel Strikers—Cast Steel Center Fillers—Malleable Iron and Cast Steel Car Castings.

CHICAGO MALLEABLE CASTINGS COMPANY
ALLIED STEEL CASTINGS COMPANY
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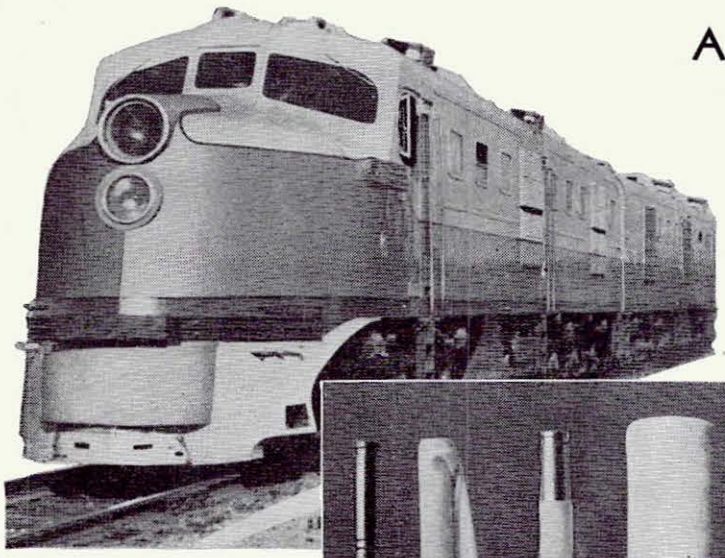
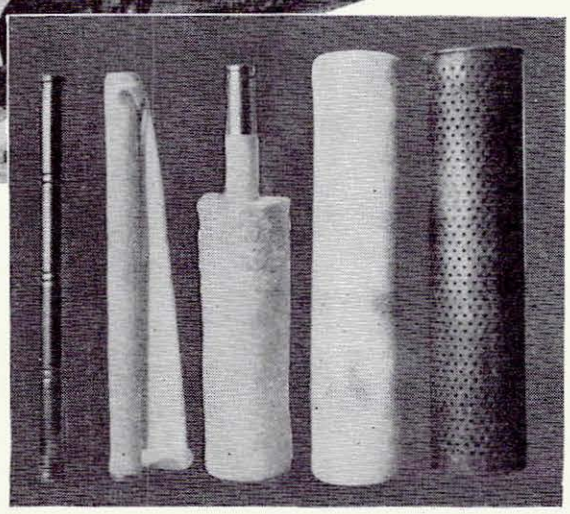


A Better Lubricating Oil
FILTER for Diesels

The M & J FILTER



elements can be applied to all internal combustion engines in any type of service.

ORIGINATORS OF THE DIESEL LOCOMOTIVE FILTER ELEMENT

M & J DIESEL LOCOMOTIVE FILTER CO.
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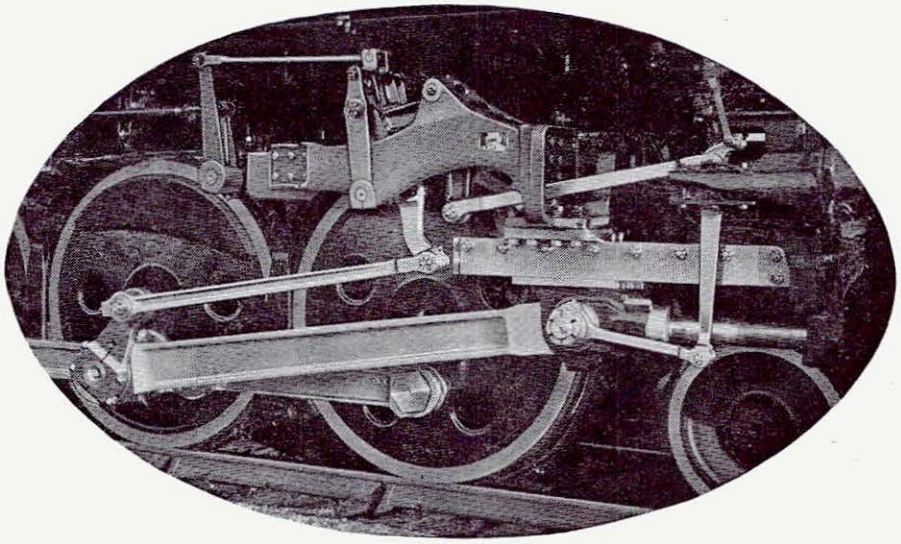
BAKER VALVE GEAR



IMPROVES VALVE EVENTS
MORE POWER WITH LESS FUEL
LESS MAINTENANCE WITH NEEDLE BEARINGS

THE PILLIOD COMPANY
FACTORY, SWANTON, OHIO
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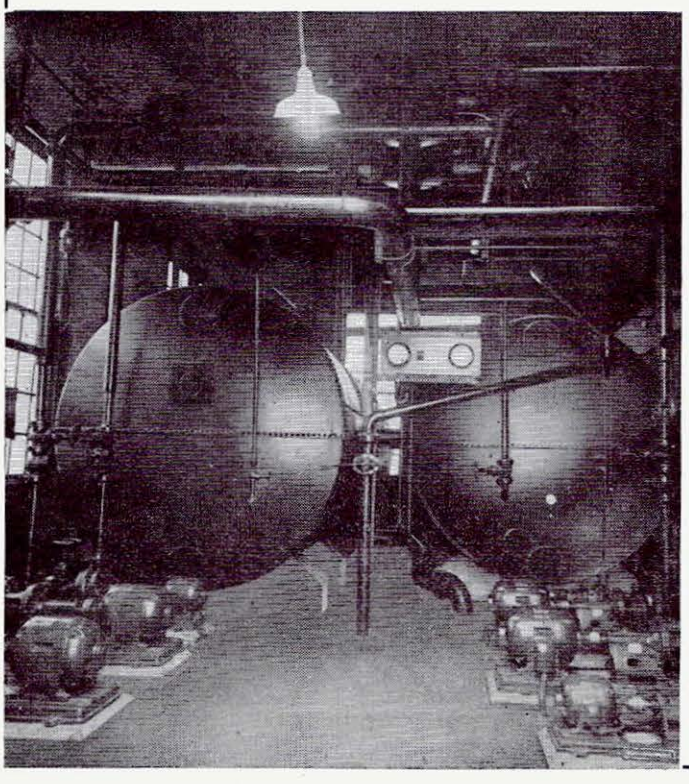
MODERN BOILER WASHING EQUIPMENT



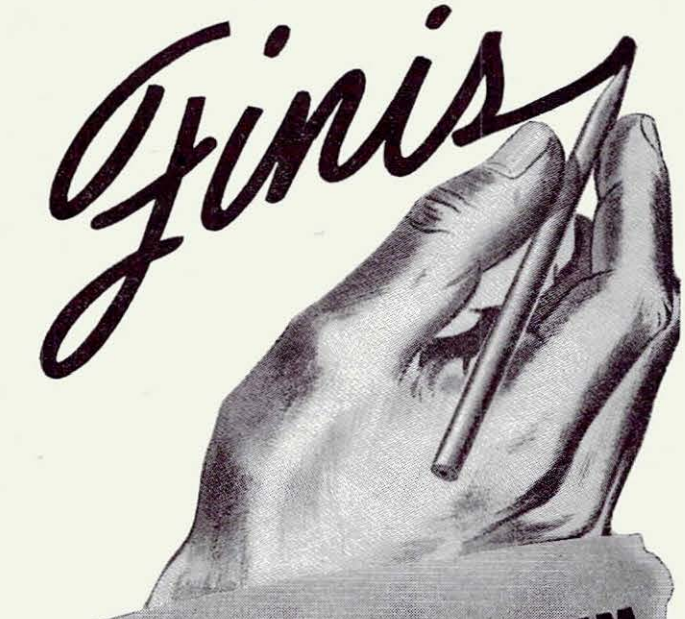
National Boiler Washing Systems are modern in every respect and are specifically designed to save time, labor, fuel, water and steam. Each installation is engineered to provide the special requirements needed at your terminal. National Systems are available with either steam pumps or electric driven pumps and are entirely automatic in operation and completely self-sustaining.

Surveys and recommendations are made without charge or obligation to railroads.

NATIONAL

BOILER WASHING SYSTEMS
80 E. JACKSON BLVD.
Chicago 4, Ill.

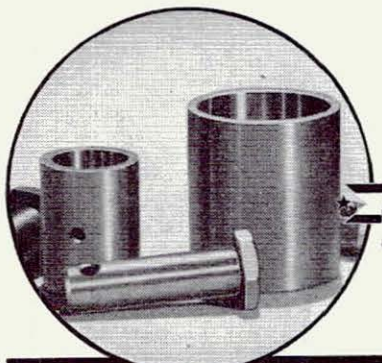
YOU CAN WRITE *finis*



TO ONE MAINTENANCE PROBLEM

WHEN YOU STANDARDIZE ON EX-CELL-O HARDENED AND GROUND STEEL PINS AND BUSHINGS

More than 125 American railroads have found that by standardizing on Ex-Cell-O railroad pins and bushings they reduce "down time", cut repair problems. Case hardened to uniform depth, Ex-Cell-O pins and bushings absorb road shock and vibration, minimize wear on costly foundation parts. They last longer. Ex-Cell-O Bulletin 32301 gives details of sizes and specifications. Write for your copy today.



XLO

EX-CELL-O *for* PRECISION

46—47

Railroad Division

EX-CELL-O CORPORATION

DETROIT 6, MICHIGAN

PIONEERING?

YES INDEED!

We 'pioneered' when we educated the Architect and Designer to the use of SEAPORCEL* Porcelain Metal for store fronts and building facades.

We 'pioneered' when we made the first installation of porcelain metal in the Marine field. The Marigold Hospital Ship was the first such vessel built with non-structural bulkheads of ceramic coated steel. Over 136,000 square feet of SEAPORCEL went into its divisional bulkheads, officers' and crews' quarters, medical offices, hospital and operating rooms and wards.

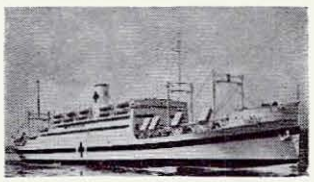


Photo by Signal Corps, U. S. Army

U. S. HOSPITAL SHIP "MARIGOLD"

So, now—let us 'pioneer' with you in developing applications of SEAPORCEL Porcelain in the Railway Field. Its uses can be decorative in passenger rolling stock, in public stations and other permanent structures.

For service under corrosive conditions nothing can equal the acid-resistant "glass" surface of SEAPORCEL parts. There is nothing superior to SEAPORCEL Porcelain (fused *into* its metal base at 1550 degrees F.) for cleanliness, for reducing fire-hazard and KEEPING MAINTENANCE COST TO A MINIMUM.

Write for Information Today—No obligation

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SEAPORCEL PORCELAIN METALS, INC.

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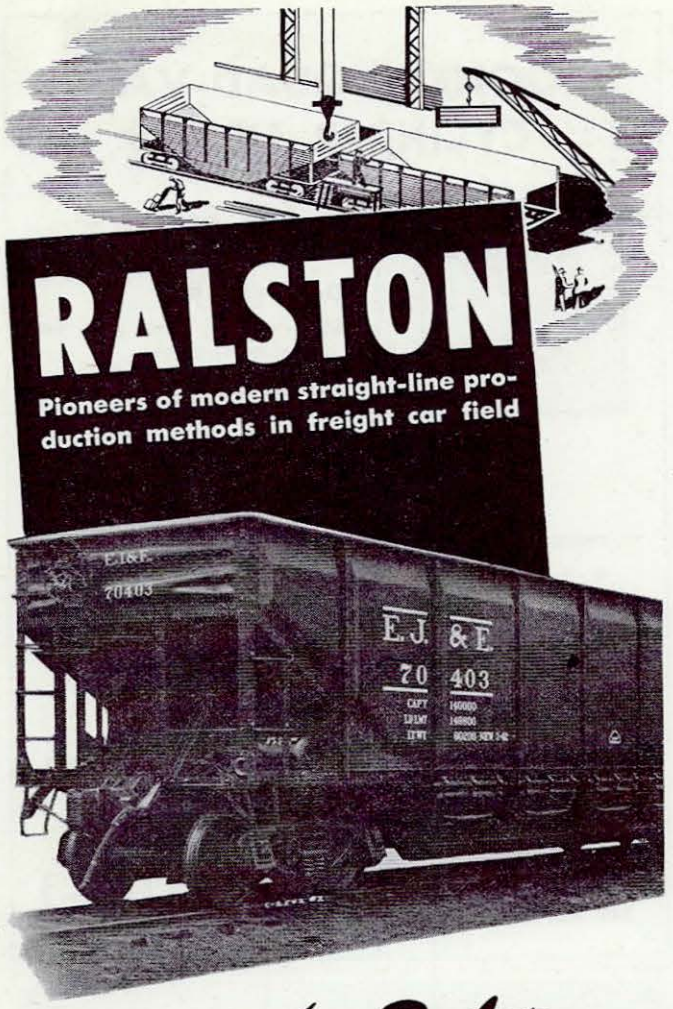

CARS *by Ralston*

are built to carry the *heavy* end of the nation's transportation load

Records prove that Ralston-made freight cars stand up *with less time-out for maintenance* in the toughest grind of capacity loads, longer and more frequent hauls, and higher speeds. This extra stamina is of vital importance in meeting today's heavy rail traffic demands.

Straight-line production techniques pioneered and developed by Ralston in 41 years of freight car construction are largely responsible for this outstanding performance. By combining specialized craftsmanship, finest materials, and rigid inspection of every part in every phase of construction, Ralston produces rolling stock which attains a greater margin of quality, dependability, and economy. These are also Ralston reasons for efficient service in the manufacture of freight car repair parts.

In any improvement program your railroad is planning which involves new freight equipment or repairs to existing cars, it will pay to check with Ralston for cost and delivery estimates.

RALSTON
STEEL CAR COMPANY
COLUMBUS 16, OHIO
Builders of Railroad Freight Cars and Repair Parts

The Enoz Research Laboratory is Pleased to Announce

2 NEW PRODUCTS

1 A WATER SOLUBLE CONCENTRATE CONTAINING 25% DDT

Provides extreme QUICK KILL-POWER . . . plus RESIDUAL EFFECTIVITY . . . plus GREAT ECONOMY. To use, simply mix with water! Recommended for coverage of large surface areas.

2 A RESIDUAL INSECTICIDE CONTAINING 10% DDT

Provides extreme QUICK KILL-POWER for a wide variety of insects . . . plus LONG-LASTING RESIDUAL PROPERTIES . . . plus ECONOMY. Especially compounded from an oil base and recommended wherever long lasting residual effectivity is required.

SEND TODAY FOR FACTS AND PRICES

In the development of these outstanding DDT Products, Enoz Research chemists have succeeded in providing industrial users with two completely new insecticides that combine all the desirable qualities of DDT with those tested quick-acting compounds for which the name Enoz has been famous for half a century. . These new DDT Products will supplement the regular line of world-famous Enoz Insecticides.

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KING PRODUCTS

KING metallic packings for locomotive piston rods, valve stems and air pumps

KING air pump lubricator

KING sanders

KING Red Top pressure indicator

THE U. S. METALLIC PACKING CO.
PHILADELPHIA 23, PENNSYLVANIA

Representatives in Canada
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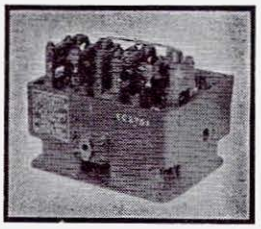
"MOONEY" QUAD-VALVE CYLINDER HEADS



FOR RAIL CAR ENGINES

Designed to fit—

Models 120, 146 and 148 Winton Engines

Models 660 and 860 Brill Engines

"MOONEY" QUAD-VALVE CYLINDER HEADS—

complete with Valve-Motion—insure

- Increased Power
- Better Fuel Economy
- More Mileage per Overhaul
- Decreased Maintenance Cost
- Better Thermal Efficiency
- Forced Water Circulation directly against and around valve seats

Manufactured by

AUTO ENGINE WORKS (INC.)
349 North Hamline Ave. Saint Paul, Minnesota

Now is the time to call on

VIKING

To Help You With Your Pumping Problem

In spite of the fact that pump deliveries are still in the future, it is a wise policy to plan now for their inclusion later. It is time to discuss your requirements for expansions, replacements and new designs. Check carefully your installation problems.

If you have a question concerning the type of pump needed and how best to install it for greatest efficiency, now is the time to work out these details.

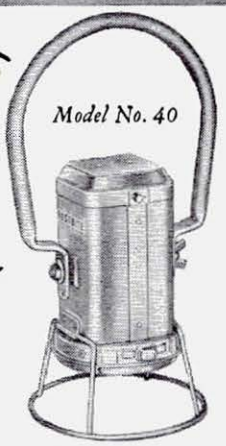
Viking's nation-wide sales and service organization is ready to lend a helping hand. Write today for free folder 46SY. It shows the latest in Viking Rotary Pumps.

See Our Catalog In SWEETS

VIKING PUMP COMPANY
CEDAR FALLS, IOWA

It's made right
It's priced right
It's JUSTRITE

Model No. 40



Winner on all counts is this Justrite Twin-Bulb Lantern that's so popular it's been named the "Trainman's Favorite." It's sturdily-built to take hard usage. Welded steel guard—strong steel case. One bulb provides a powerful "spot" beam that can be clearly seen from the end of a long drag. Other bulb extends further beyond reflector, provides for regular signalling. And—it's designed to reduce maintenance costs—extra strength in construction—principal parts easily removed for adjustment or repair.

JUSTRITE MANUFACTURING COMPANY
2063 N. Southport Ave., Dept. D-1, Chicago 14, Ill.

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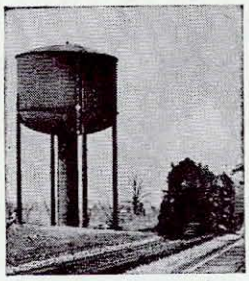

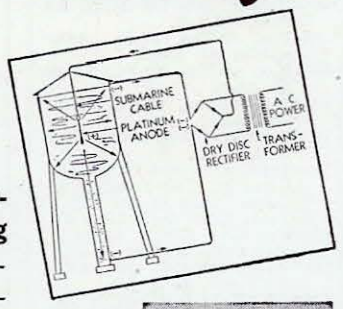

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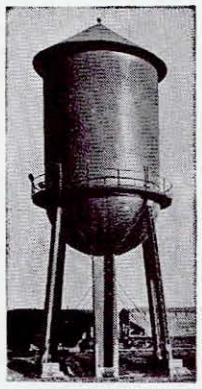

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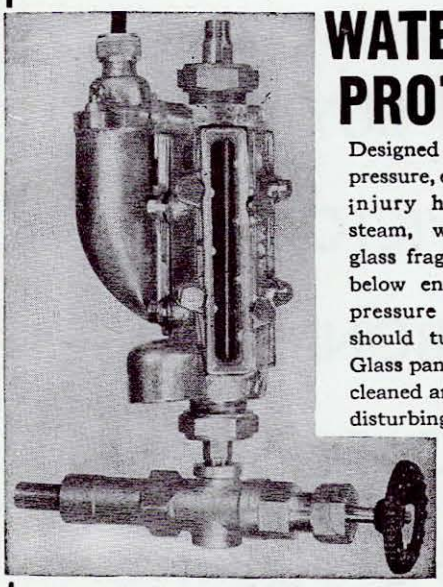

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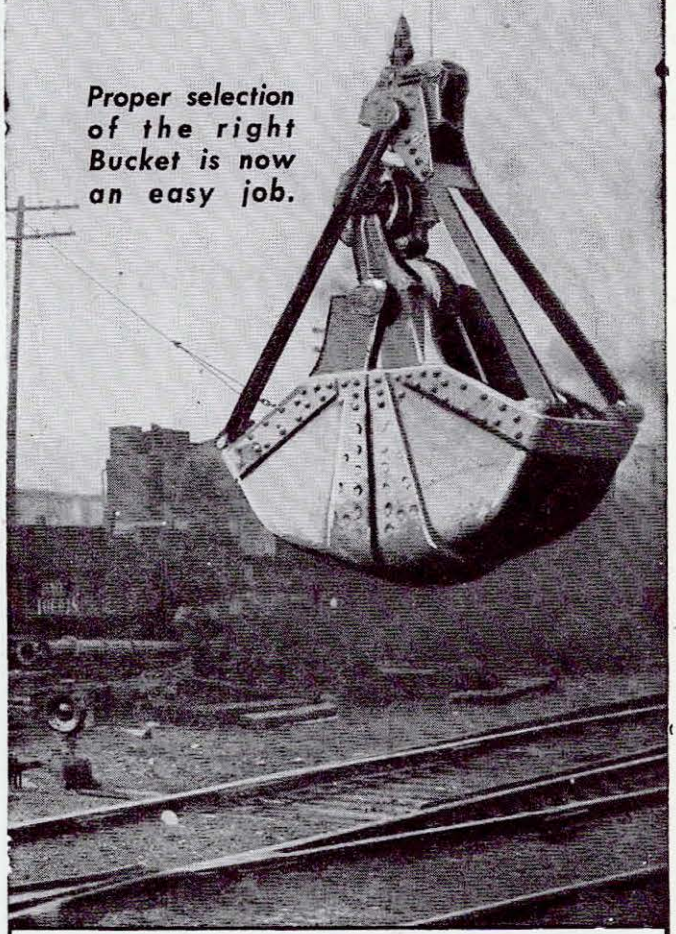

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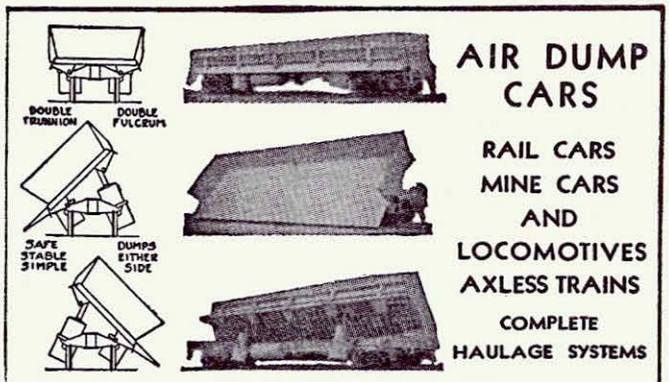

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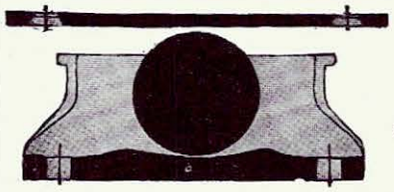

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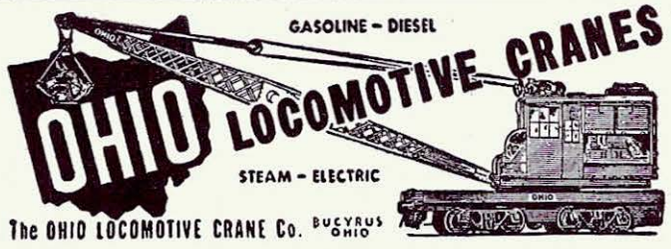

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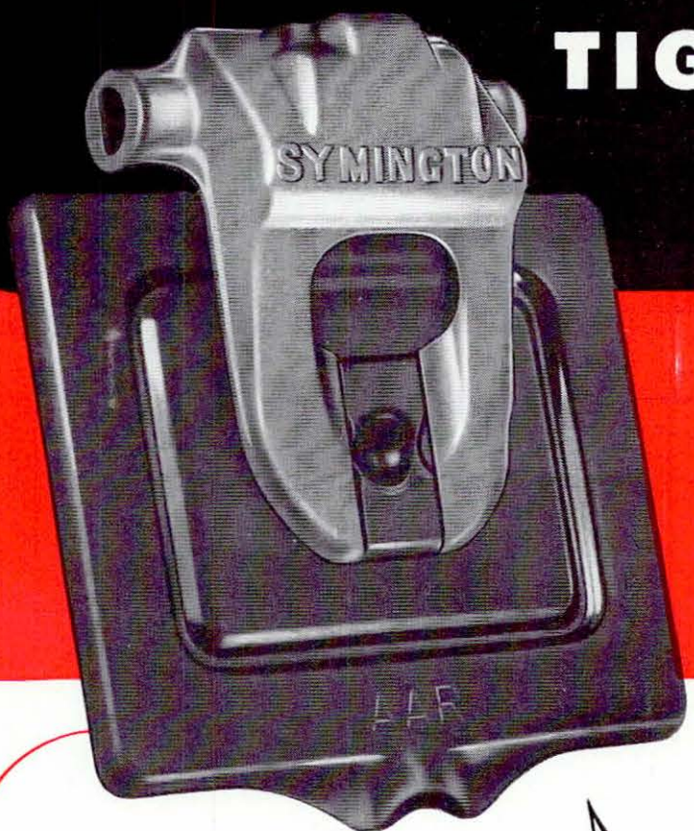

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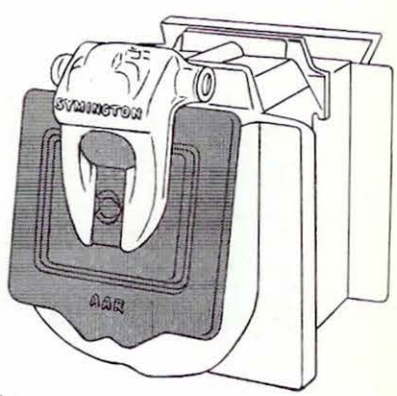

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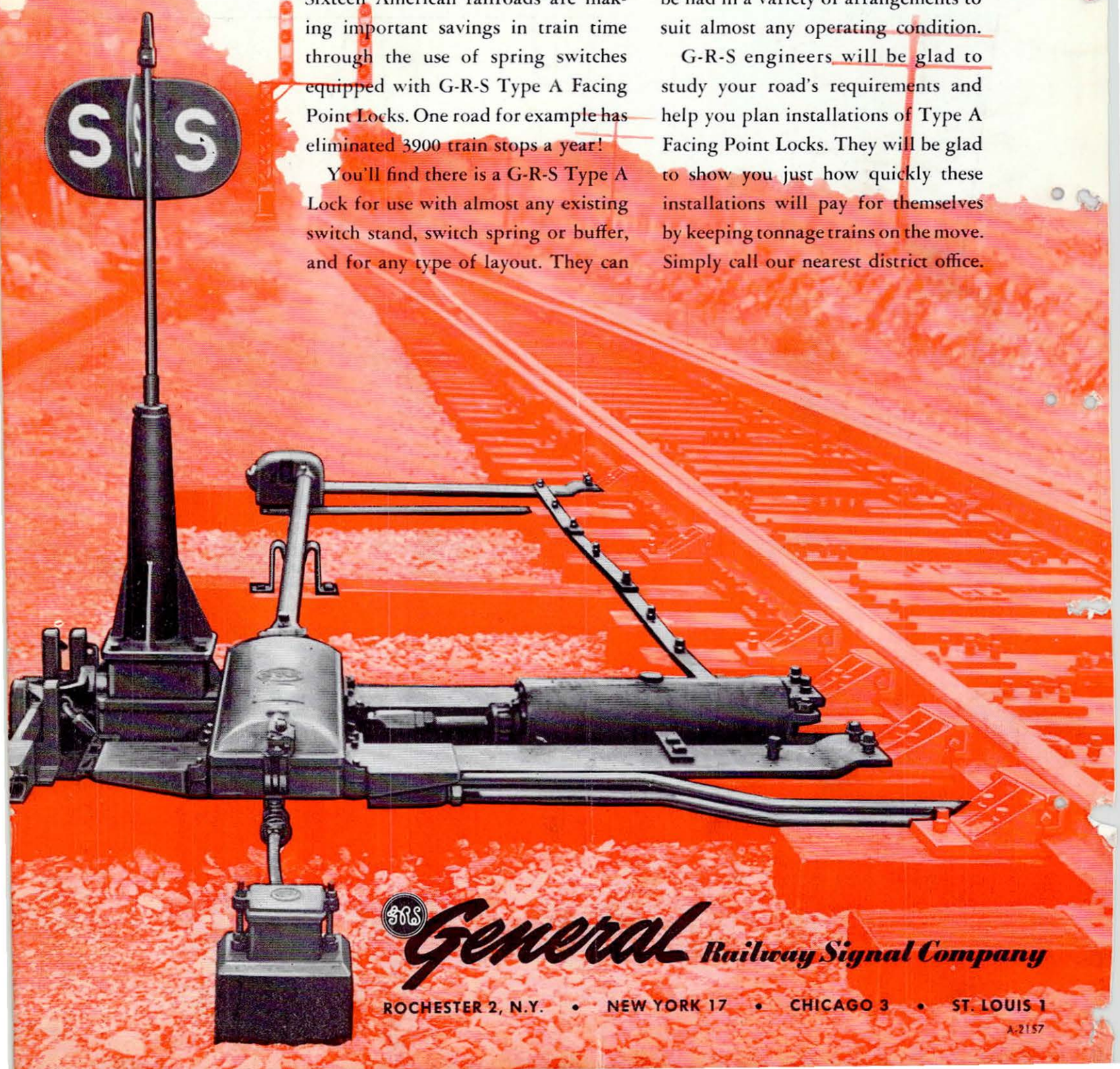

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